The Journal of the American Medical Association

VOL. XXV. CHICAGO, NOVEMBER 2, 1895. No. 18.

ADDRESSES.

INTRODUCTORY ADDRESS.

Delivered at the Chicago Medical College.

BY EDMUND ANDREWS, A.M., M.D., LL.D.

CHICAGO.

DO NOT LET YOUR LATIN SPOIL YOUR ENGLISH.

You have all prepared yourselves with some knowledge of Latin and Greek to assist your medical studies. Many of you have received degrees from colleges and universities such as Bachelor of Arts, Bachelor of Sciences, Master of Arts, etc., given as honors for your hard study in these and other branches. Your knowledge of Latin and Greek will immensely facilitate your understanding and memory of technical terms, as well as promote your skill in writing prescriptions and will prove a valuable element in your mental culture. To this end and to this extent, you may well be glad of your knowledge of the classic languages. Connected with this knowledge, however, there is a peril besetting the development of your literary style. It is the danger of allowing Latin and Greek derivatives to crowd unnecessarily into your speech and writings, corrupting the purity of your English, and giving to your productions an air of stiffness and pomposity.

It is true that many organs in the human body, and many physiologic processes have no English names, and we are compelled to make use of a certain number of technical terms borrowed from the Latin and Greek, but words of this group are long and generally harsh in sound, and they work roughly and badly in the construction of English sentences. They should be used therefore as sparingly as possible. They do not harmonize well with Anglo-Saxon speech.

High literary authorities condemn the needless loading of sentences with these half foreign words. If a new word has to be composed to express a new and unnamed fact, make it as short and as smooth in sound as possible, remembering that pure, simple, crystalline English constitutes the best style. Do not spoil it by loading it down with pompous polysyllables of Latin and Greek origin.

That master of good style, James Russell Lowell, laments our inferiority to English writers in this respect. He says: "It has long seemed to me that the great vice of American writing and speaking is a studied want of simplicity. Very few American writers wield their native language with the directness, force and precision that are common as the day in the mother country. While the schoolmaster has been busy 'starching' our language and smoothing it flat, the newspaper reporter has been doing even more harm by stretching and swelling it to suit his occasions." Such is Lowell's opinion.

Short Anglo-Saxon words of common use are the best, wherever they will express the meaning. It is this choice of short words, resulting in a condensed style of singular force, which gives the writings of Shakespeare and the English translation of the Bible much of their tremendous power.

It is amusing and yet vexatious to see a worthy medical gentleman whose ordinary conversation is in a simple and good style, suddenly swell up when he writes a medical article. He changes his whole dialect and fills his pages with a jangle of harsh technical terms, not one-third of which are necessary to express his meaning. He tries to be solemn and imposing. For instance, a physician recently devised a new instrument, and wrote it up for a medical journal under this title, "A New Apparatus for the Armamentarium of the Clinician," by which heading he doubtless hopes to make the fame of his invention "go thundering down the ages" as Guiteau said.

Another writer wanted to say that cancer is an unnatural growth of epithelium. He took a big breath and spouted the following: "Carcinoma arises from any subepithelial proliferation by which epithelial cells are isolated and made to grow abnormally." Now, then, you know all about cancer.

A writer on insanity illuminates the subject as follows: "The prodromic delirium is a quasi-paranoiac psychosis in a degenerate subject. A psychosis of exhaustion, being practically a condition of syncope."

The following is an effort to say that certain microbes produce the poison of erysipelas: "The streptococcus erysipalatosus proliferating in the interspaces of the connective tissue is the etiologic factor in the secretion of the erysipelatous toxins."

A large cancer of the liver was found at a postmortem examination and reported about as follows: "A colossal carcinomatous degeneration of the hepatic mechanism."

Still, the man of big swelling words is not always up in the clouds. If called to a case of accident, he examines the injury, and may inform the family in quite a simple and dignified manner that their father was thrown sidewise from his carriage breaking his leg and putting his ankle out of joint, but if he writes out the case for his medical journal, he gets up straightway on his stilts and says: "The patient was projected transversely from his vehicle, fracturing the tibia and fibula and luxating the tibio-tarsal articulation."

Your man of solemn speech is peculiar. He does not keep a set of instruments—not he—he has an armamentarium. His catheters never have a hole or an eye in them, but always a fenestrum. In gunshot injuries, a bullet never makes a hole in his patient, but only a perforation. He does not disinfect his armamentarium by boiling, but by submerging it in water elevated to the temperature of ebullition. He

never distinguishes one disease from another, but always differentiates or diagnosticates it. His patient's mouth is an oral cavity. His jaw is a maxilla. His brain is a cerebrum, his hip joint is a coxo-femoral articulation. If his eyelids are adherent, it is a case of ankylo-symblepharon. If he discovers wrinkles on the skin, they are corrugations or else rugosities. He never sees any bleeding, but only hemorrhage, or sanguineous effusion. He does not examine a limb by touch or by handling—he palpates or manipulates it. If he finds it hopelessly diseased he does not cut it off—that is undignified. He gets out his armamentarium and amputates it.

I like the sturdy contempt of our English brethren for all mere word pomp and prudishness. In London they still call their most fashionable avenue for horseback riding by its ancient name of "Rotten Row." In Chicago we would long ago have changed it to "Grand Washingtonian Cavalry Boulevard."

The surgeon over there generally shows the same solid traits as their other writers, and you will do well to study the writings of the eminent Frederick Treves of London, as a model in this respect.

A good British surgeon has good culture and good common sense combined. He takes his trocar and taps a dropsy, for instance. Not so the American. He blushes to hear such plain speech from his British brother, but he takes his armamentarium and goes out straightway and performs paracentesis abdominis. Still the pompousness is not all on one side of the ocean, and it is refreshing to see an occasional touch of it beyond the seas, just to show that we are not the only sinners in this respect.

A celebrated British surgeon explains his opinions as follows: "Septic peritonitis, save where definable from evidence wholly extrinsic to the condition of the peritoneum, is an etiologic entity which exists only in the mind of the pathologic metaphysician." Nothing worse than this was ever written on our side of the water.

Two of the stilted phrases which have recently gotten into vogue are etiologic factor and etiologic entity. They are both snobbish substitutes for the plain English word, cause.

The Greek word *'αιτια*, means a cause. *Αιτιολογια*, from which we derive etiology, is compounded of *'αιτια*, cause, and *λογος*, which taken in composition means a study or science. The whole means the science of causes. *Αιτιολογιχος*, from which we derive etiologic, means a person skilled in the study of causes, or a thing pertaining to the science of causation. Factor is a Latin word, lugged in improperly, to mix with the Greek. It is of the masculine gender and signifies a man doing or producing something. As an English word it also has a mathematical use. Putting the whole jumble in order, an etiologic factor ought to mean some person or thing skilled in, or related to the science of causes; or, in other words, a causative-science maker, or a maker of something or of somebody pertaining to the science of causation. In the name of all the gods of Greece and Rome, what idea are these men trying to express? If they mean cause why don't they say cause and be done with it? Language is not manufactured; it grows. The speakers of each tongue have evolved it through the ages by the process of trying thousands of new words, and instinctively rejecting such as lack the music and fitness required for speaking purposes. They have tried all ways of molding words into sentences until the perfected language, like mosaic work in the hands of some great master, has become fitted to express all the high and inspiring thoughts of men.

Such a language is the pure English of to-day. Derived mainly from the Anglo-Saxon, its words are chiefly monosyllables, but they are all gems, and all polished and fitted to each other by ages of use. Whoever is master of it, is an artist in the highest sense. Whoever thrusts into it a rough, harsh, polysyllabic word, crudely quarried out of a Greek or Latin dictionary, is like a fool who drives a pickaxe through a magnificent mosaic picture, and then plugs the hole with a brickbat.

The author who dumps upon us a book full of long and ragged new words, merely to display his knowledge of ancient languages, shows his ignorance of English, and brands himself as a bungler and a literary blockhead.

As I said before, use newly coined words sparingly, but when they become necessary, select them as carefully as you would choose jewels for your bride. Fit them, polish them, and make them suitable for flashing forth the best thoughts of human souls.

It is curious that the half-educated man who knows little or nothing of the classics, always dotes most on these big phrases, and is ever foremost in piling up the abominable rubbish-heap of long, scraggy words which deform medical literature, and render it a melancholy spectacle to gods and men.

The evil is intolerable, and in your day a reform will be demanded. Bear in mind that your lives are to be spent in an atmosphere of higher culture than that of your predecessors.

The finer culture of the future will demand a reorganization of our word system, and will cast to the moles and the bats very much worthless material which is now the pride of the ignoramuses who invented it. Prepare yourselves therefore for the change, and do your best to make the language of future science more bright, pure and simple, and more fit for the use of all who wish to couple clearness of thought with beauty of expression.

SOCIOLOGY AND CRIMINOLOGY.

Address at opening of Department of Sociology and Criminology, at the Medico-Legal Congress.

BY CLARK BELL, ESQ.
NEW YORK.

That public interest in sociologic studies is on the increase in our day, can not be questioned. We may recognize its hold on popular thought, by remarking that in the present Congress more papers are contributed to the Department of Sociology and Criminology, than to any other. This is not in my opinion the result of chance, but is due to the increasing interest manifested in the world of thought in this domain of scientific investigation.

Especial stimulus has been given to the study of criminology by Lombroso's writings, and others of his school.

Enricco Ferri has touched it with his brilliant lance. Herman Kornfeld, Morris Benedikt, Kraft Ebbing, Morel, Le Grand du Saulle, Brierre du Bois Mont and Prosper Depine on the continent; Havelock Ellis, W. W. Ireland, Pritchard, Thomson, Dr. Nicholson and W. Douglass Morrison in Great Britain, and many other writers of distinction have illumined its

importance. The International Congress of Penal Law, attracted twice, many great names from all the world, to this subject.

It is not crime alone that we study now, with method of punishment, sentences, prisons and their management, including discipline and corporal punishment in prisons, all the offenses and the modifications in penal statutes, but we are coming to study more, the criminal himself, his characteristics, degeneracy, heredity, and above all environment.

Are punishments for crime, as defined in our penal statutes, really deterrent? Has the State the moral right to inflict punishment in any retaliatory spirit as is now oftentimes the basis of penal statutes? and if experience demonstrates that excessive or prescribed forms of punishment do not act in fact as a deterrent in diminishing crime, should we not consider with greater care what modifications are proper to reach the end desired, beside the protection of society, a perceptible decrease in the volume of crime?

The lesson of the repeal of long list of capital offenses in Great Britain since the day when sheep stealing was a capital offense, must not be lost. Severity of punishment does not appear to operate as a deterrent. It seems to be true that the fear of the scaffold rarely deters the murderer.

Crime seems in the ocean of humanity, to be the sum of social causes, which, like great rivers, flow toward and empty into it. Its Amazon is, no doubt, alcoholic stimulants which more than all other causes combined, constitute the inevitable, terrible, irresistible scourge of the race. In its currents, tides and eddies, are insanity, epilepsy and physical degeneracy, not always in the parent, but more certain in the offspring. Its movements run like the blood of man into the veins and lives of children's children, with a taint as terrible as that of leprosy or syphilis.

The burdens to the State for the care of the insane in the rural districts or counties, notably in an agricultural county like Yates, where I reside in the summer, in this year of grace is actually greater than the cost of the schools, and almost equal to the entire other expense of the State government including the canals.

When will we have the courage to look this awful question squarely in the face, and decrease the volume of crime, not by penal laws for the punishment of the criminal (often the victim of his birth and environment) but by striking at and repressing the cause.

The recognized defects in our penal laws, especially in Great Britain, the United States and many of the continental states may be summarized as follows:

1. The principle of equality of sentences, as to their duration as now existing, is erroneous and vicious in its fundamental principles.

2. It is wrong to make arbitrary punishments for the same offenses against all offenders alike.

3. Criminal laws must be so framed as to meet the social conditions of the criminal classes.

Laws based upon the social conditions of men in the ordinary walks of life, fail. They should rather be aimed at the social life and condition of the criminal classes. I quite agree with W. Douglass Morrison of the Wadsworth Prison in England, when he asserts that: "The criminal is a product of anomalous biologic conditions, as well as adverse circumstances."

4. Some plan should be devised in the administration of punishments to offenders, under which the principle of determinate sentences should be applicable to the individual condition of the offender. For example: (*a*), the same offense should not receive the same punishment in all cases, as for example, when committed by an adult, or a child or a youthful offender; (*b*), the difference in punishment for the same offense by a man and by a woman, should be rather to *the* man and *the* woman.

5. We must consider whether Bentham was right in insisting that we should, in adjusting our methods of punishment, look as much to the nature and condition of the offender as to the nature of the offense. Much of the failure of our present system as a protection to society is unquestionably due to our ignoring this fundamental law in our present penal statutes, and punishment of criminals.

Mr. Morrison strikes at an important principle, that we should place our prisons on the same basis as the penal laws. That prisons should reach the causes and conditions which produce the criminal, and the penal statutes be placed on the same plane.

ORIGINAL ARTICLES.

PROGNOSTIC SIGNIFICANCE OF ALBUMINURIC RETINITIS.

Read in the Section on Ophthalmology, at the Forty-sixth Annual Meeting of the American Medical Association, at Baltimore, Md., May 7-10, 1895.

BY E. OLIVER BELT, M.D.

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WASHINGTON, D. C.

It seems to be generally admitted that the retinitis following scarlet fever and pregnancy is not of special prognostic significance as to vision or mortality, for under careful treatment recovery of both vision and health are not unusual in these cases. Therefore in this paper, such cases have been excluded, as the prognosis is altogether different and unfavorable in the retinitis of chronic Bright's disease. Though improvement of vision very frequently occurs in albuminuric retinitis, it is of minor importance in comparison with the life of the patient, and the main point which I wish to determine is the average duration of life after the appearance of retinitis from renal disease. The statistics heretofore published upon this subject deal mostly with hospital cases, in which the duration of life rarely exceeds one year. Occasionally we see reported a case in private practice which has survived five, ten, and even fifteen years (Noyes mentions one of ten years, and Webster reports the case of a minister who survived seventeen years). This led me to think that we might be able to give a more hopeful prognosis in cases which could receive good medical attention with the proper hygienic surroundings, and I decided to try and find, whether or not the average duration of life was greater among private than among hospital cases. With this end in view, a few weeks ago I requested quite a number of ophthalmologists throughout the country to report the cases which had occurred in their private practice to me. The time allowed was too short for many to look over their records, and many had not kept trace of the patients after referring them back to the family physician, but enough cases were reported to show that the duration of life is longer among private patients, and that renal affection is undoubtedly influenced by hygienic sur-

DIED WITHIN TIME DESIGNATED BELOW.

Physician.	Total cases.	3 mos.	6 mos.	12 mos.	18 mos.	2 yrs.	Over 2 yrs.	Living after first Observation.
J. H. Thompson, Kansas City, Mo.	15	....	....	13	....	....	.....	One 7 mos; one 2 mos.
W. V. Marmion, Washington, D.C.	10	....	....	....	10	....	.....	.....
Hiram Woods, Baltimore, Md.	4	1	....	....	....	....	.....	One 6 mos; one 5 mos.
Wm. Cheatham, Louisville, Ky.	9	1	2	2	2	2	.....	one 18 mos.
Geo. T. Stevens, New York	1	....	....	....	....	....	One 11 yrs.	.....
S. C. Ayres, Cincinnati, Ohio	2	1	1	....	....	....	.....	.....
G. H. Good, Cincinnati, Ohio	1	....	....	....	....	1	.....	.....
J. A. Spalding, Portland, Me.	6	1	2	1	....	2	.....	.....
H. B. Young, Burlington, Iowa	3	2	....	....	....	....	One 5 yrs.	.....
David Coggin, Salem, Mass	30	....	28	....	....	....	.....	.....
Richmond Lennox, Brooklyn, N.Y.	2	1	1	....	....	....	.....	.....
P. A. Callan, New York	1	....	....	....	....	....	One 9 yrs	.....
W. F. Mittendorf, New York	6	3	1	....	1	1	.....	.....
E. C. Rivers, Denver, Colo.	3	....	....	2	....	....	.....	One 8 mos.
R. J. McKay, Wilmington, Del	11	....	5	3	2	....	One 3½ yrs	.....
E. Oliver Belt, Washington, D.C.	2	....	2	....	....	....	.....	.....
Total	106	10	42	21	15	6	6	6

Deducting the six cases not traced 2 years, leaves the following total: 100 cases; 3 months, 10 per cent.; 6 months, 42 per cent.; 12 months, 21 per cent.; 18 months, 15 per cent.; 2 years, 6 per cent.; over 2 years, 6 per cent. Died within 1 year, 73 per cent.; within 2 years, 94 per cent.

PRIVATE CASES.

G. Hartridge	5	1	1	3	....	....	.....	.....
James Anderson	3	2	1	....	....	....	.....	.....
Simeon Snell	8	3	3	1	1	....	.....	.....
Possaner and Haab	39	....	....	19	....	4	Four 3 years; two 8 years; ten 2 to 5 yrs.	Ten 2 to 5 years.
E. Oliver Belt	100	10	42	21	15	6	.....	.....
Total	155	16	47	44	16	10	22	

Died within 1 year, 62 per cent.; within 2 years, 85 per cent.; over 2 years, 14 per cent.

HOSPITAL CASES.

Miles Miley	45	26	11	5	3	....	.....	.....
Possaner and Haab	33	....	....	24	....	3	5	Three over 2 yrs. 1 less
Total	78	26	11	29	3	3	5	

Died within 1 year, 85 per cent.; within two years, 93 per cent.; over 2 years, 6 per cent.

MIXED CASES.

C. S. Bull	103	16	14	27	7	11	Six 3 years; four 4 years; one 6 years; one 7 years.	Fourteen 6 mos. Two 1 year.
	Deducting 16 cases not traced 2 yrs. leaves							
	87	16	14	27	7	11	12	.....
Dr. Gruening	100	....	....	....	....	100	.....	.....
Total	187	16	14	27	7	111	12	

Died within 1 year, 65 per cent.; within two years, 93 per cent.; over 2 years, 6 per cent.

Private	155	16	47	44	16	10	22	.....
Hospital	78	26	11	29	3	3	5	.....
Mixed	187	16	14	27	7	111	12	.....
Total	419	58	72	100	26	124	39	

Died within 1 year, 72 per cent.; within 2 years, 90 per cent.; over 2 years, 9 per cent.

roundings. However, the number of cases surviving two years was disappointingly low, and the consensus of opinion, as shown from the following extracts from letters received, seems to be that nearly all prove fatal in less than two years.

Dr. G. E. de Schweinitz, of Philadelphia, says: "So far as I know, there is no case in my private practice that has lived longer than two years after the development of the retinitis."

Dr. J. L. Thompson, of Indianapolis, says: "Have had between fifty and one hundred cases scattered through my books in a private practice of twenty-four years. Several of my patients have died within thirty days, while others have lived two years. Many more died within six months after its first manifestation in the eyes than lived after that period."

Dr. Walter B. Johnson, Paterson, N. J., says: "In many cases the retinitis was the first indication of kidney disease, which after discovery almost invariably progressed very rapidly."

Dr. Peter D. Keyser, of Philadelphia, says: "That the length of life depends upon the retinal appearance at the time of the first examination. In well marked cases, I should say an average of twelve months, if the patient is under good medical care. I have had some cases to run two years; others only three months."

Dr. L. A. W. Alleman, Brooklyn, N. Y., says: "Save in some cases due to pregnancy, I have never seen a pure case of albuminuric retinitis last over a few months from the time it has come under my observation."

Dr. Samuel D. Risley, Philadelphia, says: "My impression is that after the appearance of eye symptoms, nephritis is rapidly fatal. I recall cases of death occurring within a few weeks, and can not recall one which did not prove fatal inside of two years, whether associated with pregnancy or not."

Dr. G. C. Savage, Nashville, Tenn, says: "My recollection of these cases is that they died within two months, and I do not remember that a single case lived longer than five months."

Dr. Charles W. Kollock, Charleston, S. C., says: "In no case in my practice has any such patient lived out the year."

Dr. Peter A. Callan, New York, says: "My impression is that the great majority die under two years after the onset of the retinal changes, but there

are exceptional cases, one of which has now lived nine years since I first made out that she had the kidney trouble with the eye complication."

Dr. George T. Stevens, New York, says: "I observe that some of our colleagues think that a fatal termination is to be expected within a few months after the discovery of the albuminuric retinitis. I can recall to mind quite a number of people who have survived several years. Mrs. K. survived more than eleven years after I found well-marked retinitis albuminuria. This is not, I think, a specially exceptional case."

Dr. David Coggin, Salem, Mass., says: "Of thirty fatal cases, I remember but two who lived over six months."

Dr. C. S. Turnbull, Philadelphia, says: "My experience has in a general way led me to think that the time is most variable, depending greatly upon the many and varied forms of renal disease in different individuals."

From all the statistics I have been able to find, we get the following results: Cases in private practice 155; of these 62 per cent. died within one year; 85 per cent. in two years, and 14 per cent. lived more than two years.

Hospital cases, 77 of these, 85 per cent. died within one year; 93 per cent. in two years, and 6 per cent. lived more than two years.

Mixed cases, 187 of these, 65 per cent. died within one year; 93 per cent. within two years, and 6 per cent. lived more than two years.

Total number of cases, 419; of these, 72 per cent. died within one year; 90 per cent. within two years, and 9 per cent. lived more than two years.

1701 H Street.

EXTENSIVE COLLOID CHANGES IN THE CHOROID, WITH REPORT OF CASES.

Read in the Section on Ophthalmology at the Forty-sixth Annual Meeting of the American Medical Association, at Baltimore, Md., May 7-10, 1895.

BY JOHN T. CARPENTER JR., M.D.

PHILADELPHIA, PA.

In some of the text-books on ophthalmology mention is made of a senile change in the fundus oculi, characterized by the appearance of small yellowish and yellowish white spots which have been regarded as hyalin or colloid degeneration in the lamina vitrea choroidea. In Noyes we find a full description under the head of degenerative changes of the choroid, in which he assumes the identity of drusen and this colloid degeneration of the lamina vitrea. He calls attention to the clinical fact that vision is not impaired in these cases. Two excellent colored plates representing two varieties of the affection are shown, to both of which I wish to call attention. In one, the large, globular, mulberry-like masses are seen both upon the nerve-head and in the outlying fundus. This plate is taken from Lawson's case, reported in the Transactions of the Ophthalmological Society of the United Kingdom, vol. III. The second from Nettleship's case, vol. IV of the Transactions of the Ophthalmological Society of the United Kingdom, shows the other variety, in which the lesions are small yellowish dots, showing a tendency to group in large numbers in the central region of the eye-ground. This picture, is a very faithful delineation of a variety of colloid change, which Tay, and afterward Nettleship, designated "guttate choroiditis." The term "verrucosités hyalines" had also been applied to this affection by French writers (Terson). Many original articles have appeared on the subject in ophthalmologic literature, among which that of A. Terson (*Arch. d' Ophthalmologie*, No. 6, 1892,) contains a complete bibliography and a very thorough resumé of the anatomic and histologic points involved. In all the reports, the fact seems to be established that these lesions are simply senile degenerative changes, or, if seen in adult life, they accompany severe intra-ocular disease.

There seems to be no excuse for the various names under which this affection has been described. There are no evidences of choroidal inflammation, but simply a retrograde change in the lamina vitrea choroidea, and hence the use of the word choroiditis is inadvisable. Colloid degeneration has been found occurring in the cartilages of old people, and according to Fuchs, the arcus-senilis is produced by colloid changes in the periphery of the cornea. The most satisfactory term for this affection would seem to be "colloid changes in the choroid." The hyalin masses on the nerve-head, or drusen, of which I reported cases in the *International Medical Magazine*, November, 1893, have been regarded until recently as identical with colloid choroidal lesions. Hirschberg, (*Centralbl. fur prakt. Augenheilk*, June and July, 1891) after extensive study of post-mortem specimens with different chemic reagents (for the details of which consult his article) advanced the opinion that these were two separate diseases. His position was strengthened by the very thorough post-mortem study of de Schweinitz, reported in the Transactions of the American Ophthalmological Society for 1892. He also believed them to be distinct affections. From the clinical as well as ophthalmoscopic standpoint, however, these lesions appear to be identical. In this article I report a case, with rough but accurate drawing of the fundus, in which typical drusen and colloid changes of the choroid are associated in the same eye-ground. There are many difficult points in arriving at a decision that will reconcile all the conditions present.

There is still considerable doubt among anatomists regarding the exact anatomic relation of the sclera and choroid at the lamina cribrosa. It has been denied that the lamina vitrea choroidea is found in this situation and hence the impossibility of these colloid masses, on the nerve-head, springing from the lamina vitrea, has been insisted upon. Again, there are conflicting views as regards the origin of the colloid changes in the choroid. By some they are regarded as of epithelial origin; by others it is claimed that the intercellular tissue of the lamina vitrea breaks down and forms colloid degeneration. Without attempting to reconcile the views advanced by different observers, the subject viewed from a clinical standpoint would seem to show the identity of drusen and these colloid changes. Patients suffering from choroidal disease affecting circumscribed areas, rarely consult the ophthalmologist on account of symptoms directly referable to the choroidal lesions. With the ophthalmoscope, the yellowish or whitish spots, often heavily pigmented and scattered over the eye-ground, constitute the familiar picture of choroiditis. It is in the associated retinal involvement, and that, too when the more central portions of the eye-ground are diseased, that reduced vision, lowered light sense, metamorphosia, photopsia or scotoma

form part of the clinical picture of choroiditis. True it is, moreover, that these associated retinal changes are the rule in inflammation of the choroid. In colloid changes of the choroid, although the ophthalmoscopic appearances are startling and the masses occupy the macular region, over an extensive area, at no time in the clinical history of the disease is the functional activity of the retina interfered with. From ophthalmoscopic examination, the observer would expect to find a large central scotoma interfering with the use of the eye and producing marked visual defect. On the contrary, sharpness of sight remains unaffected and there is not even a reduction in the light-sense as tested by lowering the illumination upon the test letters.

There are two distinct clinical groups which have as their distinguishing features the size of the separate globular formations and the character of their arrangement in the fundus. In the first group, corresponding to "guttate choroiditis," the affection occurs as separate, small, yellowish dots, often no larger than the diameter of a retinal vein; showing a marked tendency to invade the macular region where they are often so numerous that an appearance of heaping is produced. At times, however, the picture is not unlike an atypical form of albuminuric retinitis.

In the second group we have large globular acinous formations similar in appearance to drusen and as in that affection, occupying symmetrical positions in both eye-grounds. Each globular mass may have a diameter equivalent to three or four times the size of a retinal vein.

In connection with this paper, three cases presenting all the features of this rare and interesting disease are reported. Before relating the clinical histories, I wish to call attention to the fact that these colloid changes when sought with the ophthalmoscope, appear much more pronounced under lowered illumination. When examined under the enlarged image of the direct method with lowered illumination, the observer frequently changing the direction in which the light strikes the fundus by moving the mirror from side to side, these translucent masses seem to be thrown into relief against the background of the fundus and their true size and appearance can then be best appreciated. In presenting the following clinical histories only the more characteristic in the two groups have been selected. Among the distinguishing features, from a general standpoint, my experience has been that the colloid changes in group one, have invariably been seen in patients past middle life, the average age being from 60 to 70. Whether it is simply a coincidence or not, rheumatism of a severe chronic type, often with articular changes, was seen in nearly every patient of this group. In one exception to this rule in which the small, yellowish colloid dots filled the macular region in a patient aged 28, there were all the evidences of marked gouty diathesis. It is worthy of note that both gout and rheumatism, as well as Bright's disease, were frequently found associated with drusen (Gurwitch).

Case 1.—Miss F., aged 63, a sufferer from chronic rheumatism, with sclerotic changes in the arteries, consulted me for presbyopic trouble. The entire fundus showed small yellowish spots more numerous in the macular region, choroidal in situation, and symmetrically placed in each eye. Her corrected vision was 6–6. Examination of the urine gave negative results. Two years later, the vision and fundus condition remained the same. The ophthalmoscopic picture suggests albuminuric retinitis.

Case 2.—Daniel F., aged 70, was seen Dec. 11, 1893. He sought advice because of inability to use his eyes at the near point. The case is important as showing both large and small globular yellowish masses in the same eye. In the right eye the ophthalmoscope showed in the temporal region around the macula lutea, an area composed of large and small colloid changes in the choroid. The largest of these masses showed a diameter equivalent to four times the diameter of a large retinal vein. There were no secondary retinal changes H=1D. In the left eye, the small yellowish dots were seen scattered more generally throughout the fundus, as well as grouped in the macular region, but no large masses were discovered. With +1.00 D ○ +1.00 cyl. ax. 90° corrected vision was 6–6. Urine examined and found negative.

Under the second group, I shall report more in detail the clinical histories of three patients in whom the colloid changes were startling in appearance, covering extensive portions of the central region in both eyes, and occurring in patients of early adult life. In one case there was pulmonary tuberculosis, in another chronic interstitial nephritis, and in the last, a marked gouty diathesis.

Case 1.—Mrs. S., aged 36, (whose fundus appearances are shown in water-colored sketch) consulted me on April 22, 1893, suffering from accommodative and muscular asthenopia. She was extremely neurasthenic, and the ophthalmoscopic examination was difficult on account of marked retinal hyperesthesia. Her appearance suggested pulmonary phthisis, and she stated that three years ago she was examined and that the sputum showed bacilli. After spending a year and a half in a warm dry climate she had returned apparently cured of pulmonary disease. In the right eye vision 6–12; in left eye 6–12. She read type D. 0.50 to 17 centimeters. At 6 meters, there was esophoria of 18°. At 30 centimeters 14°. She had been suffering from severe headache and weak eyes, complained of diplopia after reading or sewing, and nausea and vomiting followed prolonged use of the eyes at close work. The ophthalmoscope revealed in the macular region of each eye an area horizontally oval 3 + 2 disk diameters, composed of globular, yellowish, mulberry-like masses over which the retinal vessels passed with some slight elevation. There were no evidences of secondary retinal changes. The lesion closely simulated drusen. Careful examination of the entire fundus showed occasional small yellowish dots but no large masses such as were seen in the macular region. An interesting fact was the high degree of esophoria, present, and the opinion was advanced by Dr. S. D. Risley, who saw the case, that the macular condition might account for the muscular defect. The diagnosis lay between tubercular disease which was favored by the general condition of the patient, and colloid changes in the lamina vitrea choroidea. Her corrected vision was 6–7½ in each eye, and the field of vision was normal. A year later when I tenotomized both interni with marked benefit to the patient, the vision rose to 6–6. Dr. de Schweinitz saw the patient and at that time spoke of its marked resemblance to a case which he has since reported with a water-color sketch of the fundus, in last year's Transactions of the American Ophthalmological Society.

Case 2.—Mrs. R., aged 40, was referred to me by Dr. H. A. Slocum for examination of the fundus. There was chronic interstitial nephritis, and some disturbance of vision, more marked in the left eye, led him to refer the case to me to determine whether the refractive error or a retinal lesion were responsible for the visual defect. Her right vision was 6–6; left vision 6–9. The ophthalmoscopic examination in the right eye showed simple congestion of the nerve-head with soft blurring of its edges. H. = 2 or 3 D. In the macular region an extensive area three times the size of the disk was covered with characteristic colloid acinous formations. There was in this eye some choroidal atrophy which was much more marked in the left though there were no retinal changes. Careful correction of the refractive error of the left eye failed to improve the vision beyond 6–9. There were no typical retinal conditions suggestive of Bright's disease. The water-color sketch of the previous case would almost apply to this fundus.

Case 3 in this interesting group, is that of Mr. H., aged 38, who consulted me on Sept. 17, 1894, on account of accommodative asthenopia. Both eye-grounds showed the most re-

markable condition of colloid changes that I have ever seen. Mr. H. was a man of slight build, nervous temperament, of strong gouty tendency, whose urine showed an excessive amount of uric acid with high specific gravity. Syphilis and tuberculosis can be absolutely eliminated from the history after a careful study. With his hypermetropic astigmatism corrected, his vision was 6–6 in each eye. The fundus presented the following remarkable characteristics: the entire choroid was occupied by numerous disk-shaped areas, three or four times the diameter of a retinal vein, yellowish in the center with lace-like delicate pigmentation of retinal and choroidal situation. The entire fundus being occupied by these colloid changes gave an ophthalmoscopic picture simulating disseminated choroiditis. In fact the diagnosis from disseminated choroiditis in this case was one of considerable difficulty. The absence of any important retinal, optic nerve and vitreous involvement, was strictly in favor of the colloid nature of the lesion as opposed to its being an inflammatory disease of the choroid. Careful examination of his field of vision showed no defect and there was absolutely no reduction in a light sense. Dr. de Schweinitz who also saw this case, was of opinion that it was colloid degeneration of the choroid, with secondary pigment disturbance without involvement of the important retinal layers. The lesion was perhaps congenital or at least of infant origin. At his suggestion I examined other members of Mr. H.'s family without finding a similar choroidal lesion on either side, although the family record was poor, there being several cases of glaucoma among maternal aunts. At the present day the vision remains normal and the fundus appearance has not changed.

Case 4.—The last case to which I desire to call attention is one presenting choroidal changes of colloid nature together with extensive denser formation of the nerve-head, which is almost concealed by thickly packed globular masses. The fundus appearances in this patient aged 59, whose corrected vision was 6–6 are shown in my rough drawing.

In conclusion, certain points in the study of this choroidal affection impressed me as being worthy of summarizing: 1, the entire absence of any visual defect resulting from even the most striking ophthalmoscopic changes; 2, the almost constant relation between senility and the multiple small colloid masses seen in group one, and the absence of any such relation in the large globular masses of group two; 3, the almost invariable situation of the lesion in the central or macular region and the symmethy of arrangement in each eye; 4, the importance while studying the fundus of using a low power of illumination and of continually changing the direction of the light from the ophthalmoscopic mirror in order to reveal the true outlines of these masses; 5, the clinical proof of the identity of drusen with these extensive colloid changes, both from the standpoint of symptomatology as well as from the fact that in at least one case, drusen and colloid changes of the choroid existed in the same eye; 6, and lastly, the importance of diagnosing this colloid change of the choroid from exudative choroiditis, tubercular disease of the choroid and in some instances from albuminuric retinitis of the macular region.

108 S. 18th Street.

DISCUSSION.

Dr. G. de Schweinitz, Philadelphia—As you know, I have had the opportunity of studying microscopically the so-called drüsen in the nerve-head and, clinically several cases of choroidal diseases resembling these hyalin bodies in the papilla. Thus far, at least, it is not proved that the drüsen and the colloid bodies springing from the lamina vitrea, are identically pathologic processes. Moreover, we are not in possession of the information which decides what relation these so-called colloid choroidal changes which I have figured and which Dr. Carpenter so well described this morning, bear to the other two lesions, viz, drüsen and colloid bodies from the lamina. Therefore I am doubtful whether all of these cases should be grouped together, although I am sure we should all agree with Dr. Carpenter that they constitute a class of cases to be separated from inflammatory disease. My experience with guttate changes is that they always produce defective central vision and negative scotoma, while these colloid macular changes in young people are not connected with defective central vision; indeed, even the light sense is perfect. Drüsen may be seen in otherwise normal nerve-heads or in one that is atrophied; therefore they may be associated, with or without visual disturbance. Symmetrical disposition of the drüsen is not universal. I have reported one monolateral case and studied another. Dr. Gifford, I know, is now studying a similar unilateral case. On the other hand, the colloid changes in the choroid, in my experience, are always symmetrical. Dr. Carpenter's cautions in regard to the best method of studying these lesions are timely.

Dr. B. Alexander Randall, Philadelphia—Several pathologic conditions are comprised in these "colloid" appearances as many of us have doubtless seen; colloid degeneration of the retinal pigment epithelium, colloid deposits in the choroidal stroma, and similar lesions in the retina akin to the mere serous vacuolization that is so commonly seen at the periphery. In a considerable group of clinical cases it has seemed impossible often to discriminate which process was present in the ophthalmoscopic picture.

Dr. Harold Gifford, Omaha, Neb.—I have followed some cases of this disease for several years. One case occurred in a girl 9 years of age with a very remarkable change in the optic nerve. This case I report as an exception, in that the sight was entirely destroyed. The retinal arteries were obliterated, whether as the result of colloid changes or of some other disease I am uncertain. One point you should consider is, What sort of prognosis are you going to give? Will they retain what vision they have through life? I have had a case in which sight was reduced to 20–50 by these changes; that is, I could find no other cause for the reduced vision.

Dr. Herman Knapp, New York—I wish to acknowledge the value of Dr. Friedenwald's paper. The subject of hemorrhages in the background of the eye is larger and more important than we formerly thought. Many of the varied appearances of striation and white or black deposits which were formerly complained of can now be referred to previous hemorrhages, after we have had time to watch a large number of cases where the gradual conversion of the blood into these conditions could be followed up. As to the clinical course of the colloid excrescences of the choroid, I have the advantage of age over most of you, in stating that for years they can remain in *statu quo*. In a gentleman whose eyes had extensive colloid deposits in the choroid, they have not notably changed these twenty years. Regarding the differential diagnosis, these excrescences may be mistaken for a disseminate choroiditis as it occurs in syphilis. In the latter disease the small patches have a somewhat notched border beset with pigment (as the colloid occasionally are too) and their color is white, the white of the sclerotic, whereas the colloid deposits look dull white like old ivory.

Dr. J. T. Carpenter Jr., Philadelphia—I am glad to hear from others that the question of diagnosis between disseminated choroiditis and some cases of extensive colloid choroidal degeneration has been one of some difficulty. The grouping of these cases was done simply from a clinical standpoint. The prognosis is invariably good as regards vision, and Dr. Gifford's cases must have been of serious optic nerve lesion, probably posterior to the papilla.

THE TECHNIQUE OF TENOTOMY OF THE OCULAR MUSCLES.

Read in the Section on Ophthalmology, at the Forty-sixth Annual Meeting of the American Medical Association Baltimore, Md., May 7-10, 1895.

BY LEARTUS CONNOR, A.M., M.D.

DETROIT, MICH.

It is desirable that both patient and operator be in good physical condition. The surgeon, his assistant, patient, instruments, and operating room should all be rendered as aseptic as possible, because asepsis is the fundamental principle of modern surgery, which no ophthalmologist can afford to disregard, even when doing an ocular tenotomy. The operator's hands should be washed with pure soap and hot water, by the aid of a hand brush, so as to loosen all bacteria and other infectious materials lodged on the skin, at-

tached to the hairs, embedded in the mouths of the oil or sweat glands or under the finger nails. This loosened *débris* is best removed by running hot water. The face, and beard (if the operator have one), are cleansed with scrupulous care. When dried, the hands are soaked in bichlorid solution, 1 to 1000. The assistant and patient cleanse themselves in a similar manner. Especial care is taken to free from all septic material the edges of the eyelids, lacrymal passages and conjunctiva by washing with the bichlorid solution. The instruments are to be sterilized in steam or boiling water, and just before using, soaked in absolute alcohol, dried and laid upon an aseptic tray. The room freed from all infection should afford adequate light, as the best work is impossible unless the surgeon can see distinctly each step.

An anesthetic, local or general, is imperative. Usually cocain suffices, but occasionally the patient is so uncontrollable as to compel the administration of a general anesthetic—ether, chloroform or methylene bichlorid. The surgeon's personal views, determines his selection of the anesthetic. Unquestionably, chloroform is more dangerous, but it is more pleasant to both patient and operator, and I do not recall a death from an ocular tenotomy done under its influence. The instruments needed are: a speculum; lid retractor; fixation forceps; fine toothed forceps; a blunt pointed scissors curved on the flat; tenotomy hooks; fine needles and fine silk sutures; sterilized absorbent cotton and bandage.

The several steps of the operation are: 1, the opening of the conjunctiva; 2, opening the capsule of Tenon; 3, lifting the tendon from its sheath; 4, division of the tendon; 5, dressing of the wound. It is improbable that any operator takes these steps exactly as any other, but all open the conjunctiva and capsule, divide the tendon and dress the wound in some manner. Some open the conjunctiva and capsule at the lower edge of the tendon and parallel to its fibers; some at the center of the tendon and in the same direction; some at right angles to the tendon fibers, either at their outer edge, at their center or along the entire line of their insertion; some make the opening large, others of medium size, and others small. Some divide the tendon subconjunctivally, others partially so, and others openly. Some unite the edges of the conjunctiva with fine silk suture; others leave the wound entirely open. Some use forceps to lift the tendon for division by the scissors; others use the blunt hook of various shapes; all however use either forceps or blunt hook. Doubtless each surgeon, by more or less unconscious experiment, finds the method suited to his personal equation, and adopts it, as giving him the best results. The end sought is the division of the tendon close to its insertion, without unduly disturbing the adjacent tissues.

Some surgeons dress the wound by putting a few drops of boric acid solution into the conjunctival cul-de-sac, then a bit of linen moistened in bichlorid solution on the closed lids, then a bit of borated cotton and, finally, a bandage over all; others after cleansing the conjunctiva, simply close the lids with isinglass adhesive plaster; others leave the eye entirely open, after the effects of the cocain have disappeared; others protect the eye from light, dust and wind with a blind, and have the eye soaked in hot water at regular intervals, to hasten repair and relieve discomfort. Good results attend any of these variations in operating or dressing, at the hands of a skillful operator. While unable to discuss their merits or demerits, the open dressing commends itself because it best utilizes the vision of the squinting eye in fixing the eyes in the best position while re-attachment of the divided tendon is taking place. If the operation be done aseptically the wound should be carefully closed by suture, unless from its small size and horizontal direction there is no necessity to exclude air after the effects of the cocain have disappeared.

In estimating the effects of a tenotomy we must consider: the weakened power of the muscle operated upon; the muscular force of its antagonist; and the elasticity of the tissues—factors which vary greatly in individual cases. Roughly, the force of the muscles can be determined by the degrees to which they are able to turn the eye in the direction of their long axes, during their greatest contraction. This motility affords a sound guide in estimating the effects of a tenotomy. Thus, if the motility of the muscles be unchanged, clearly the operation is ineffective and the cause must be searched for and removed.

To operate intelligently, the surgeon must, first, measure the extent of the strabismus; and to know his results he must repeat his measurement after the tenotomy. The best means for making such measurements are the use of prisms, producing double images at 6 or 7 meters. The difficulty with this method, lies in the fact that not all squint eyes possess sufficient vision to render it available. Such cases compel the surgeon to select a method applicable to them. The varieties of these are legion. Some operators depend entirely upon their own eyes, both in measuring the amount of squint, and the perfection of its correction. Others mark with an ink dot, the position of the center of the pupil or edge of the cornea of the squinting eye, on the edge of the eyelid, both in the squinting and fixing position—the space between the two dots roughly measuring the deviation. The strabismometer, with others takes the place of the ink dots. In Graefe's method, the flame of a candle is fixed by the squinting eye at a distance of 5 meters, and the zero point of the scale brought beneath the corneal image of the flame. Then the fixing eye is arranged for the same flame, and we note how far from the middle of the pupil the squinting eye has deviated from zero. The observer should be in the visual axis of the squinting eye, while making his observation. The secondary variation of the fixing eye is measured in the same manner. Of the many other methods, by perimeters, tapes, boards, etc., we can not speak.

In my own work, the following technique has proved satisfactory: the vision of each eye is carefully noted, all ametropia, ascertained under atropin, fully noted, if such correction will diminish the strain upon the weaker muscles, The power of the several muscles is measured, all defects being accurately recorded. The method of ascertaining the amount of squint is selected according to the character of the case, always when possible utilizing prisms. The operation is planned, so that there will remain a slight convergence immediately after the tenotomy of the interni or externi; but in vertical squint I aim to undercorrect. In all cases it is sought to secure such motility of the muscles as will so obviate their defects as to enable them to center the visual lines

upon an object within the fields of vision. The accomplishment of this frequently calls for the division of the operation between the muscles of the two eyes, even though an operation on one might make the eyes straight. The instruments used are a pair of scissors, curved on the flat, both points blunt, blades narrowed near their ends, firm enough to divide the tendon without springing, and so nicely adjusted as to cut the tissues to their very ends. The forceps are delicate, yet sufficiently strong, that they readily grasp and hold firmly the tendon. The blunt hook is curved nearly at a right angle and quite small, as it is used to lift but half of the tendon at once, because I operate from the center toward either side. The speculum and lid retractor are unimportant, if only they afford an unobstructed view of the field of operation, and cause the patient a minimum of discomfort. The lid retractor in the hands of a good assistant, is especially convenient when operating upon the superior or inferior recti.

The fixation forceps is rarely called for, except in cases requiring a general anesthetic, because under cocain the patient is able to hold the eyeball in the correct position. These instruments are sterilized, dried, soaked in absolute alcohol, wiped and placed on a clean tray just before using.

The patient lies in a half reclining chair, facing a good light, with head wrapped in towel moistened in bichlorid solution, and clothes covered with a clean apron to the neck. The operator, assistant and patient have been rendered aseptic by the method described.

The cocain solution, 4 per cent., made with distilled water and 16 grains of boric acid to the ounce, is dropped in the cul-de-sac of the eye to be tenotomized, repeated every few moments till the conjunctiva has become insensible, and during the several stages of the operation, as the case demands.

The assistant steadies the patient's head, prepared to remove with absorbent cotton any hemorrhage which may obstruct the field of operation.

In tenotomy of the internus, the operator sits or stands, facing the patient, who is directed to turn the eyeball strongly outward; the conjunctiva is seized with the forceps, so as to make a small vertical fold, directly over the insertion of the tendon. With the scissors this fold is divided, making a short horizontal opening of the conjunctiva. Through this opening the forceps grasp the tendon sheath forming a vertical fold similar to that made in the conjunctiva; this fold is divided, thus laying bare the tendon, which is seized by the forceps so as to make a horizontal fold, and by slight traction from the eyeball, exhibits its insertion. The division of this fold close to the sclerotic, by the scissors, makes a central opening into the tendon. The fibers on either side are now severed, by placing one blade of the scissors beneath, and one above the tendon but below the conjunctiva, and closing the blades one or more times as may be needed. Usually this can be done completely by the scissors alone, but if it fails, the little blunt hook is made to enter the wound in such a manner as to catch stray attachments, and permit their division with the scissors. The motility of the eye outward is now examined; if it equals that of the other eye, enough has been done, but if it retain the same motility as before the operation, then the occasion needs to be sought and removed. The behavior of the eyes when fixed upon an object at one-sixth of a meter or less is important; if they diverge, we know that the effect is too great and must be limited by suture. If they converge as before the operation, the tenotomy has been imperfect; but if the eyes remain steady or slightly converged, the result will be satisfactory; or, still more certainly, if, when tested by prisms, at 6 meters, the eyes maintain a condition of vertical equilibrium—the misplaced arc of movement of the squinting eye has been replaced in its normal position.

But if the tenotomy has failed to adequately reduce the convergence, we have several courses of procedure; doing of a tenotomy on the other eye; severing more or less freely the attachments of the muscle or muscles; the use of sutures; advancement of the weaker muscle; or increasing the relative power of the defective muscles as in insufficiencies. In convergent squint I have never had occasion to use a suture to increase the effect of the tenotomy. In tenotomy of the externus, the eyeball is turned strongly inward in the horizontal meridian; the conjunctiva grasped by the forceps at about 7 millimeters from the external border of the cornea and the other steps taken as when operating upon the internus. About 2 degrees may be gained by a simple tenotomy of the externus, though this is uncertain and likely to diminish after a time. The use of sutures from the superficial fibers of the sclerotic, at the inner sclero-corneal junction, to the inner commissure, will enable the surgeon to greatly increase this effect. If both eyes be tenotomized, the sutures may be tied over the bridge of the nose, and the divided ends of the tendons made to unite with the sclerotic as far back as desired. I prefer the advancement of the weaker muscle to the use of sutures in divergent squint.

In tenotomy of the superior rectus, the eyeball is turned downward as far as possible, so as to bring its insertion fully in view. The assistant by a lid retractor lifts the upper lid, the conjunctiva is opened at about 8 millimeters from the corneal margin, and the further steps taken as in the other tendons. The insertion of this tendon is near that of the superior oblique, and slants outward and backward, points worthy of remembrance during the tenotomy. Tenotomy of the inferior rectus is done in the same manner as that of the other tendons, the insertion being about 7 millimeters from the corneal margin.

After each operation the position of the eyes, and the motility of the muscles are carefully studied, so that if the effect be insufficient it may be increased by some available method, or if it be too great it may be restricted.

The opening into the conjunctiva is so small and so located that it usually closes sufficiently without suture. The conjunctival cul-de-sac is cleansed with boric acid solution; the eye protected from light by a shade until the effects of the cocain have passed away, and then left open. The patient is directed to soak the eye in very hot water frequently, to relieve discomfort and promote repair of the wound.

An ocular tenotomy, done after the manner described, is nearly painless and bloodless, absolutely free from any danger, involves the least traumatism; gives very definite results; requires no after dressing; and secures binocular vision, if this be possible by a tenotomy.

103 Cass Street.

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THE SLIGHT EFFECT SOMETIMES OBTAINED AS THE RESULT OF FREE TENOTOMIES OF THE OCULAR MUSCLES FOR HETEROPHORIA.

Read in the Section on Ophthalmology, at the Forty-sixth Annual Meeting of the American Medical Association, at Baltimore, Md., May 7-10, 1895.

BY SAMUEL THEOBALD, M.D.

OPHTHALMIC AND AURAL SURGEON TO THE JOHNS HOPKINS HOSPITAL, AND TO THE BALTIMORE EYE, EAR AND THROAT CHARITY HOSPITAL.

BALTIMORE.

I believe it is a generally recognized fact that in operations upon the external eye muscles for the correction of heterophoria or of strabismus, a given amount of "tenotomizing"—if one may use this convenient, but, perhaps, not altogether legitimate word—is by no means always followed by a corresponding and definite amount of correction. The same degree of section of the muscle and capsule in one case produces a marked effect, while in another, the result of a precisely similar operation is comparatively slight. No comprehensive and satisfactory explanation of this fact, so far as I am aware, has yet been offered, and I think it may be safely asserted that even the most experienced operator can not say with any assurance, in advance of a tenotomy, just what the effect of a given amount of cutting will be.

As a general principle, it may be asserted that the result of a tenotomy upon an ocular muscle will depend upon the extent to which the muscle's attachment to the sclerotic is set back. If the divided tendon re-attaches itself to the sclerotic, without slipping back—at the point of its previous attachment—the effect will be almost or quite *nil;* on the other hand, if it slips back considerably, the effect will be marked. In accordance with this generally recognized rule, when one wishes to obtain a decided effect from a tenotomy one does not limit the section to the tendon, but divides more or less freely Tenon's capsule, which permits a wider recession of the muscle; while, if a slight effect is desired, one includes in the section only the tendon proper. To this extent the effect of our operations is under control; but the fact still remains that the result of a given amount of cutting varies very greatly in different individuals. While, as has been said, we do not fully understand the reason of this, the matter is one as to which we are, at all events, not wholly in the dark.

It may be safely affirmed, I think, that, other things being equal, the smaller an eyeball is, and, perhaps, the more deeply seated it is in the orbit, the less will be the effect of the division of one of its muscles; the larger the ball and the more prominent its position, the greater will be the effect. Hence it follows that, as a rule, a tenotomy upon a hypermetropic eye may be expected to produce a less marked result than a similar operation upon a myopic eye. The explanation being that in the larger, and more prominent myopic eye the tendon recedes to a greater extent before becoming re-attached than it does in the smaller, and less prominent, hypermetropic eye.

My experience inclines me to the belief also that, usually, a tenotomy performed for the correction of an actual squint produces a relatively greater effect upon the muscular balance of the eyes than does one performed for the relief of heterophoria; and here, again, it is probably a question of the extent of the recession of the divided muscle, for this, it would seem, is likely to be greater in the case of the contracted muscle of squint, than in the muscle of normal length with which we have to do in heterophoria.

The comparative size of the muscle operated upon, whether a thick, well developed muscle or the reverse, has also seemed to me to have an influence upon the result. For example, a tenotomy performed upon a slender internal rectus muscle, which has only been able to develop a convergent squint of intermittent character, will produce a more decided effect than one upon a well developed muscle, such as is usually found in the fixed type of convergent strabismus.

It seems probable, too, for some reason that we do not yet understand, that the muscles of certain eyes, when separated from the sclerotic, have a greater disposition to retract toward their orbital attachment than the corresponding muscles of other eyes; and this would tend to increase the effect of their division. The thickness and strength of Tenon's capsule, which doubtless vary in different individuals, would also probably exert an influence upon the recession of the muscle and hence upon the effect of the tenotomy.

While in strabismus we usually expect a better and more decided result from a tenotomy performed upon the internal rectus than from one done upon the external rectus, the striking instances of slight effect following free tenotomies for heterophoria which I have met with, have invariably occurred in operations upon the internal recti for esophoria.

In order not to consume the time of the Section, I shall describe briefly only two of the most striking of the cases of this character which I have encountered, but I may state that I have the records of others which almost parallel them:

Case 1.—Miss P., a school girl, about 16 years of age, was brought to me in November, 1893, for the relief of asthenopia. The ophthalmoscope revealed only a slight amount of hypermetropia, but showed marked negative symmetrical aberration of both eyes. By the vertical diplopia test there was esophoria at 20′ of 11°; at 13″ of 8½°. A later examination, a few days subsequently, gave, however, by the same test, only 7½° of esophoria at 20′, and 7° at 13″. A mydriatic was used (hyoscymia hydrobromate) and revealed hardly .75 D. of hypermetropia. Under its influence there seemed to be a little astigmatism according to the rule, but this finding was not confirmed after the effect of the mydriatic disappeared. With paralyzed accommodation, the esophoria at 20′ was 10½°.

On Dec. 8, 1893, the vertical diplopia test having previously shown esophoria at 20′=9°, I did, as my notes state, a "pretty free tenotomy" of the L. internal rectus. Two days afterward there was esophoria at 20′=1°, with orthophoria at 13″. May 3, 1894, with L. eye +.50s, R. eye +.37s, there was esophoria at 20′ varying from 9° to 11°. At this time I prescribed glasses for constant wear as follows:

L. eye ⊃ .50s Prism 3° base out.

R. eye ⊃ .37s Prism 3° base out.

May 19, the vertical diplopia test gave, with these glasses on, additional esophoria at 20′ of 10°, *i. e.*, a total of 16°. I then did "a free tenotomy" of the R. internal rectus, dividing Tenon's capsule "almost as freely as for squint," as noted at the time in my record of the case. Two days afterward, without correcting glasses, I found esophoria at 20′=7°; at 13″=4°. A few weeks later there was esophoria at 20′=11°.

The last examination of the muscular balance was made Oct. 31, 1894, and showed, by the vertical diplopia test, with full correction of the manifest hypermetropia, esophoria at 20′=9°. Thus it will be seen that in this case a free tenotomy was performed upon each internal rectus (one of them involving a liberal division of the capsule) without appreciably reducing the original esophoria; for, it will be remembered that the esophoria at the first examination varied in amount from 11° to 7½° at 20′.

Case 2.—Mr. W., aged 26, artist, consulted me on account of asthenopia, in July, 1890. He was wearing at the time for each eye +.50c 90′. Without correcting glasses the verti-

cal diplopia test showed esophoria at 20′=10½°; at 13″=8°. There was no hyperphoria. The ophthalmoscope showed less than 1.D. of hypermetropia, and this was subsequently confirmed by the use of a mydriatic (a 2 grain solution of duboisia). A later test, with full correction of the astigmatism and manifest hypermetropia, showed esophoria at 20′=9½°; at 13″=8°.

July 24, 1890, I divided the L. internal rectus "completely." Two days later there was esophoria at 20′=10¼°; at 13″=7°. July 31, esophoria at 20′=11½°; at 13″=7°; adduction at 20′ =35°; abduction =8°. August 2, I did a "free tenotomy" of the R. internal rectus, "dividing the outlying fibers of Tenon's capsule." Two days later there was still esophoria at 20′ =8°; at 13″=6½° to 7°. October 14, with the glasses prescribed for the correction of his manifest error of refraction, there was esophoria at 20′=6°; at 13″=2°. Without correcting glasses, there was esophoria at 20′=7°; at 13″=4°. At 20′ there was adduction =46°; abduction =10°. March 12, 1891, with his correcting glasses, there was esophoria at 20′=7½° to 8°; at 13″=4°; no hyperphoria. As the result of gymnastic exercises with prisms there was, subsequently, a reduction of the esophoria of about 2½°, which, however, was probably not permanent. In this case, as will be seen by a comparison of the tests made with correction of the manifest refractive error before and after the operations, there was, as the result of two free tenotomies (such as would have sufficed, in many cases, for the correction of a decided strabismus) a lessening of the esophoria at 20′ of scarcely 2°, and at 13″ of only 4°.

Before concluding, it may be well to mention the manner in which the tenotomies were performed in these cases and in other similar cases which I have met with. Before the introduction of cocain it was my habit to perform all tenotomies subconjunctivally; but, I soon found that with the eye under cocain this operation was not so easy of performance, because of the tightening effect of the cocain upon the conjunctiva. I, therefore, abandoned this method, and adopted the "button-hole" operation, which I have since employed in all cases. In performing this operation, I make a longitudinal incision through the conjunctiva directly over the attachment of the muscle, and then free the conjunctiva from the underlying tissue. Next, I seize the tendon with forceps, and divide it just at its point of attachment to the sclerotic. After the tendon proper has been divided, I introduce my crochet-pointed strabismus hook through the opening thus made and extend the incision upward and downward, dividing, more or less freely, as may be indicated, the lateral fibers of the tendon and Tenon's capsule. This was, then, the method in which the tenotomies were performed in the cases which I have related.

304 W. Monument Street.

THE LIMITATIONS OF TENOTOMY OF THE EYE MUSCLES.

Read in the Section on Ophthalmology, at the Forty-sixth Annual Meeting of the American Medical Association, at Baltimore, Md., May 7-10, 1895.

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If we assume parallelism of the visual lines to be the functional position of rest, maintained by unconscious innervation and divergence, the anatomic position of rest (Hansen-Grüt), orthophoria or equilibrium for far and near is a condition of adjustment or relatively equal tension or balance of nerve and muscular force, and is not in any sense a condition of repose or relaxation of the muscles as in sleep or in ether narcosis.

Heterophoria and Heterotropia, tendencies to deviation or deviations, are the result of spasm or supranormal contraction of a muscle or set of muscles, or of weakness or insufficiency of their antagonists.

In this paper I will consider, very briefly, the abnormal relations of the visual axes, non-paralytic in origin, and the operative methods which theory and practice seem to demand for their adjustment.

1. *Esotropia or Internal Strabismus.*—Hypermetropia is the cause in 75 to 90 per cent. of all cases. The squint is manifest and "active" and depends upon the relation of accommodation and convergence. In recent cases the contraction of the internus is excessive and the abduction is of normal strength. In ancient cases the muscular structure has undergone molecular change and abduction has become weakened.

(*a*). *Concomitant or Alternating Squint*, fixation with either eye, the vision practically the same in each. Amblyopia is necessarily precluded. The deviation is upward and inward, the latter manifest, the former easily demonstrated by the relatively lower position of the false image. The obliquity of the squinting eye is convincing evidence of the associated and responsive action of the external muscles supplied by the third nerve to the stimulation of the accommodation, but it has no bearing on the result of treatment directed to the interni, since the upward deviation is transferred with the inward, when fixation is transferred, and since both eyes functionate, though not simultaneously, neither external rectus undergoes degeneration or indeed loses any of its abducting power. When the prolonged paralysis of accommodation followed by full correction of hypermetropia worn for a sufficiently long time have proved inefficacious, tenotomy of each internal rectus, dividing the operation equally between the two muscles, and without advancement of either externus, is the proper surgical procedure. The effect of the operation can be readily determined by the approximation of the false and true images, and when finally they have fused, the desire for binocular fixation or of fusion will maintain them single.

(*b*). *Constant Monocular Squint*, one and the same eye always used in fixation, the squinting eye amblyopic. The cornea of the amblyopic eye is turned inward and upward, owing to the combined action of the extrinsic muscles under the control of the third nerve. Outward rotation is limited. The external rectus is deficient in power and innervation, the muscle itself having become flabby, stretched and incapable of normal function. Tenotomy of either or both internal muscles is unavailing, without advancement of the external of the squinting eye. In addition, section of the superior of the same eye is often necessary. The operation, sometimes practiced, of extensively dividing the internus together with its lateral attachments, thus practically paralyzing the muscle, gives a temporary cosmetic improvement but is to be deprecated, since that eye in the course of a few months or a year will become divergent. We can rarely, if ever, in these cases restore the function of the squinting eye, and our operations may be the cause of annoying diplopia.

2. *Exotropia, or Divergent Strabismus.*—The common causes of external squint are: loss of convergence through deficient innervation or muscular weakness; and loss of convergence from mechanic and anatomic obstacles to adduction. The former

is found in those cases which arise independently of refractive error and can not be ascribed to it; in patients convalescing from exhausting illnesses; in neurotics or those who suffer from accommodative asthenopia from low degrees of heterophoria and astigmatism and whose general muscular and nervous system is responsive to slight abnormalities. It is seldom due to absolute supra-normal strength of the externi but innervational weakness of the interni; not a loss of muscular power of each internus, for the balls are susceptible of full rotation but a loss of convergence, probably of central origin.

In order to effect a cure, adduction must be raised to the normal standard. The innervation may be increased, I believe by nerve tonics, such as nux vomica and the muscular contractile power by prism exercise, but these means are unavailing and a waste of time unless binocular vision is present, at least in part. Surgical interference is necessary and we have an apparent choice of three procedures—tenotomy, advancement, or a combination of both. Tenotomy is objectionable since we are destroying instead of building up, weakening a normal set of muscles to a degree to correspond to an abnormal weakness of the antagonists, limiting abduction and perhaps giving crossed diplopia for near, and homonymous diplopia for far, and never restore equilibrium.

The mechanical and anatomic obstacles to convergence are the increased length of the eyeball in myopia and the divergence of the orbits and the upper and outward position of the eyes in utter relaxation of the muscles as in sleep. The divergence of myopia is passive and chronic and follows the inability of the interni, unstimulated by and unassociated with accommodative effort, to converge the lengthened balls. Tenotomy alone is useless. Correction of the myopia, demanding the use of the accommodation on near work, prism exercise and advancement of the interni are sometimes effective. Careful inquiry into the history of cases of divergent squint will sometimes develop the interesting fact that the present deformity is the result of an early operation for the opposite defect. In such cases the advancement of one or both interni, without section of the externi is to be recommended.

3. *Hypertropia.*—The causes of functional hypertropia have been but little discussed. The traditional internal squint of hypermetropia is, according to Stevens (*New York Medical Journal* February 17), to be explained by the associated hypertropia, but he fails to name a cause for the latter. In my opinion hypermetropia is responsible for both, on the assumption that the strain on the accommodation induces overaction of not only the internal rectus but of the superior and inferior recti and of the inferior oblique. The image of the squinting eye is always on a plane lower than that of the fixing eye. Hypertropia in heterophoria and in low grades of myopia where the accommodation is active, should theoretically be cured by advancement of the superior oblique. This is, however, impracticable. In concomitant squint, hypertropia needs no treatment; in constant squint, tenotomy of the superior rectus is often necessary. Hypertropia in myopia (a rare complication) may be traced to a relaxation of all the muscles under the control of the third nerve, when the superior oblique and the external rectus having no opposition the cornea is rotated outward and downward (hypotropia).

4. *Heterophoria.*—The same principles of therapeutics apply to the tendencies to turn as to the actual turnings. A very large proportion of the cases are eso-hyperphoria depending upon hypermetropia and astigmatism and require no surgical interference.

5. *Esophoria.*—A course of atropia or other mydriatic paralyzing the accommodation for some days, followed by the wearing of as near as possible, full correction, will often remove the symptoms for which tenotomy seemed to be indicated. Indeed, the presence of esophoria will often indicate latent hypermetropia. Guarded tenotomy of both interni will sometimes cure. It often may be repeated. Advancement is indicated when adduction is weak.

6. *Exophoria*, as exotropia, is a passive condition and can not be directly ascribed to an error of refraction as a constant cause and is due also to an innervational weakness of convergence. Tenotomy is powerless to effect more than a temporary cure. Advancement of the interni will often permanently cure.

7. *Hyperphoria* seldoms demands operation, notwithstanding the extraordinary claims made by enthusiasts. It is to be treated by a correction of the error of refraction which in most cases is its cause. Partial or complete tenotomy is to be performed only when full correction fails. An operation is successful when we can determine binocular fixation for all distances and there is no limitation of adduction or abduction or of lateral movements. Tenotomy as formerly practiced—wide division of the tendon and lateral attachments on the squinting eye only, invariably leads to disfigurement by recession of the caruncle and conjunctiva, and to loss of movement on the side governed by the operated muscle, with homonymous or crossed diplopia or both. Landolt has urged for twenty years that advancement shall substitute tenotomy in all cases of insufficiency and in most cases of strabismus. He reserves tenotomy for these cases only in which advancement has proved inefficient. His reasons are given in his paper read before the Congress in Edinburgh in 1894, to which I refer the reader who is not already familiar with the transactions of the Congress; these reasons are logical and forcible and will no doubt influence those uncertain as to the choice of operation. In my own experience, most satisfactory results have been obtained, in patients in whom I had failed to give more than temporary benefit by tenotomy. My method of operating by advancement is that recommended and, I think, suggested by Savage of Tennessee, with a slight modification. The conjunctiva and capsule of Tenon are dissected away, and the muscle and tendon exposed as far back as may be necessary for the insertion of the sutures. The muscle is elevated on two hooks and freed from its surrounding connective tissue. One needle of a double-armed thread is passed from without inward through the upper, and the second needle through the lower border of the muscle and the thread is drawn tightly, intersecting the muscle vertically its entire width. Each needle is then inserted from above downward and below upward, respectively, through the upper and lower border of the tendon at its insertion—*without separating the tendon from the sclerotic.* Before drawing the threads tight, a small portion of muscle back of the tendon and in front of the suture is excised, in order to oppose fresh surfaces which will more rapidly unite, and to prevent the lump which Savage says is always made. The muscle back of the suture is then

grasped with fixation forceps by an assistant and brought forward to relieve the strain on the suture. When the suture is made taut, the knot is tied. No conjunctival suture is necessary.

254 S. 16th Street.

TENDON ADVANCEMENT AND TENDON RETROPLACEMENT.

Read in the Section on Ophthalmology at the Forty-sixth Annual Meeting of the American Medical Association, at Baltimore, Md., May 7-10, 1895.

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Reference is here made to advancement of tendons as distinguished from tendon resection or tendon shortening. In the latter two, the stump of the partially severed tendon furnishes the point of attachment of the portion to be brought forward. Not so, however, in tendon advancement. This operation is required as a remedy for strabismus, insufficiencies, and for the results of old operations excessive in their effects. Tendon retroplacement is here recommended as a control procedure, in connection with complete tenotomy, and is to be practiced at the time and as a part of the original operation.

It may as well be said at once that in the opinion of the writer, the operation for tendon advancement, as described by Stevens and performed with the singularly delicate instruments which he has given us, may be substituted with advantage for all other operations heretofore described. The small conjunctival opening with its minimum of integumental traumatism, the almost total-subconjunctival location of the sutures, the unirritating character of the sutures owing to their small size, the ease and exactness with which it may be practiced, and the freedom from after-irritation during the process of healing leave little to be desired.

In a single particular only has any modification of Stevens' method seemed advantageous and that relates to the location of the stitch making the attachment to the globe. The conjunctival stitch which he recommends having occasionally failed, I have sometimes made a sclerotic attachment not involving the conjunctiva. A very small curved needle carrying the 000.000 thread of Stevens' is passed through the center of the extremity of the tendon to be advanced from without inward, and is carried forward to a point within the region denuded by the conjunctival incision and at the point selected for the attachment of the tendon and back of its original insertion. The needle is now made to enter and traverse the superficial layers of the sclerotic, tunneling a distance of 1 or 2 millimeters in length and barely deep enough to make a firm hold, the firmness of which hold may be tested after the emergence of the point of the needle by a lifting motion at the hand of the operator. The result is the tacking down of the tendon in a perfectly definite way to tissues of sufficient firmness to maintain the fixation of the parts involved until healing shall have taken place.

It is to be expected that the result obtained at the time of operation will closely approximate the result finally reached. I have frequently found a difference under these circumstances of not more than 1° or 2°. The usefulness of such an operation in cases of old post-operative deformities is manifest.

Tendon retroplacement is in a certain sense a control procedure applicable in tenotomy where accurate dosage is essential. In such cases, it not infrequently happens that section of a tendon less than complete severance fails to produce a sufficient result, while a complete section results in an excess. For example: in a lateral heterophoria of 15° in each eye, not more than 8° or at most 10° can be obtained by partial section—an insufficient correction. A complete section may result in 20° to 25° of effect—an over correction. Under such conditions, the correction may be made quantitatively exact by first making the complete section and then at once advancing the tendon to the proper point, there tacking it down. If we endeavor, as I think most of us do, to make our corrections in equal quantities on both eyes, this procedure will be found not infrequently useful, at times indeed indispensable.

It will be seen that this, considered as a control procedure, differs radically from that often employed, in that the large conjunctival wound and the conjunctival suture are here discarded.

1807 Chestnut Street.

THE INDICATIONS FOR, AND THE ADVANTAGES AND TECHNIQUE OF, MUSCLE SHORTENING.

Read in the Section on Ophthalmology, at the Forty-sixth Annual Meeting of the American Medical Association, at Baltimore, Md., May 7-10, 1895.

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In the judgment of the author of this paper, muscle shortening is indicated in all cases of heterotropia, regardless of the direction or extent of the turning. In many cases of low degrees of squint the shortening operation alone will effect a cure; while, in a greater number of cases, the shortening of the weaker muscle should be associated with a partial division of the tendon of the stronger muscle in order to the attainment of the best results. In cases of high degree of exophoria in which a partial tenotomy of both external recti does not reduce the exophoria within the range of possibility of completing the cure by rhythmic exercise of the interni, the latter should be shortened. In all cases of exophoria with less than 8° of abduction, shortening of the interni is indicated, not to be associated with even the slightest tenotomy of the externi. In high degrees of esophoria not reduced by a partial tenotomy of the interni within the limit of possibility of completing the work by exercising the externi, the latter should be shortened; while in the lower degrees of esophoria, the only operation indicated is the shortening of the externi. In any case of hyperphoria not reduced to 2° or less by a partial tenotomy of the superior rectus of the hyperphoric eye, the inferior rectus of that eye should be shortened. In all cases where shortening is indicated, except in hypertropia and hyperphoria, the operative effect should be equally divided between the corresponding muscles of the two eyes. The superior and inferior recti of a cataphoric eye should be operated on rarely if ever. Since the shortening of the recti muscles, associated with partial tenotomies of the opposing muscles can effect so much, a complete tenotomy of an ocular muscle can not be often indicated.

THE ADVANTAGES OF SHORTENING

a muscle, over the older method of muscle advancement, may be set forth in a few words: the former is more easily done, and is the safer of the two opera-

tions, in that torsion of the eye is not so likely to occur as a result of setting the tendon too high or too low, in case the externi or interni are the muscles involved, or too far out, or in, when the superior and inferior recti are the muscles in question. Should the knot come untied in the shortening operation, the patient's condition will not be worse after the operation than before, which can not always be said when the same thing happens in the attempt to advance a muscle. An apparent objection to the shortening operation is the knuckle of the muscle formed by the folding, but this disappears by absorption within a few weeks.

THE TECHNIQUE OF MUSCLE SHORTENING

was simple when first introduced, but has grown in simplicity as a result of a modification suggested and practiced by Dr. Tenney, of Boston. The original operation was performed as follows: the eye was cocainized; the lids were separated by a stop speculum; the conjunctiva was seized with fixation forceps a little behind the insertion of the muscle tendon, and two cuts with scissors were made, one vertical the entire width of the tendon and a little behind the insertion; the other below and parallel with the lower border of the tendon and muscle. The included portion of the conjunctiva was then dissected up and held out of the way. A puncture of the capsule of Tenon was next made, at the lower border of the tendon near its insertion, and another puncture at a corresponding point at upper border of the tendon, through which a strabismus hook was passed beneath the tendon, with which to control the eye. A silk thread was then armed with two needles, one of which was passed through the upper part of the muscle and capsule from without in, at a chosen distance behind the insertion, and, similarly, the other needle was passed through the lower part of the muscle and capsule at a point immediately in line with the first. Drawing on the two ends, a loop of thread was brought in contact with the capsule over the muscle. The passage of these needles was facilitated by lifting the respective borders of the muscle with fixation forceps. The next step of the operation was to lift the tendon by means of the hook and pass, first one needle and then the other, through the tendon from within out, at points one-eighth of an inch apart, bringing these needles out through the conjunctiva, a little in advance of the tendon insertion. The two needles were now removed and, by means of the surgeon's knot, the part of the muscle beneath the loop of thread was drawn up to the insertion of the tendon, thus shortening the muscle to a corresponding extent. The flap of conjunctiva was now allowed to fall down over the knuckle of muscle. The stitch thus taken was allowed to remain from four to six days, at the end of which time the muscle was firmly fixed, by adhesive inflammation, in its new relation.

The modification suggested by Dr. Tenney, in a personal letter, I at once adopted. As thus modified the operation is done as follows: a horizontal cut is made with scissors through the conjunctiva and capsule of Tenon, beneath the lower border of the muscle from the insertion of the tendon backward, to the extent of the shortening desired. Through this cut two strabismus hooks are passed,—one beneath the tendon at its insertion; the other beneath the muscle. By means of these hooks the muscle is lifted from the sclera. A needle is now passed through the conjunctiva and the upper border of the tendon at its insertion and is carried back beneath the muscle to a point chosen just in advance of the second hook, where it is made to penetrate the muscle near its upper border and the superposed capsule and conjunctiva. The needle is then made to reënter the puncture in the conjunctiva made by it in its exit, is directed downward between the conjunctiva and the capsule and is brought out through the incision in the conjunctiva. Then the lower border of the muscle and capsule are seized with forceps and this needle is made to penetrate them from without in, and is again brought out through the horizontal incision. The needle is now passed through the incision beneath the tendon which it is made to penetrate at the lower border of its insertion and is brought out through the conjunctiva at a point in line with, and one-eighth of an inch below, the primary puncture. The two ends of the suture thus passed are now brought together by a surgeon's knot with enough force to bring the part of the muscle beneath the loop in contact with the tendon. The suture is allowed to remain from four to six days.

The suture plate, recently introduced by Dr. Chalmer Prentice, of Chicago, as modified and improved by Dr. George H. Price, will most likely be of much service in this operation, if for no other reason than that it will greatly facilitate the removal of the suture. The improved plate is made of aluminum, is five-sixteenths of an inch long and one-eighth of an inch wide, oval in shape. In this plate there are two holes one-eighth of an inch apart, through which the two ends of the suture are passed. In tying the suture, the plate, which has such a concavity as to fit the curvature of the eye, is brought in contact with the eye, and the knot is tied over it between the two holes. There is a transverse groove near one hole along which one blade of the scissors is passed when the suture is to be removed.

SLIGHT EFFECTS OF TENOTOMIES OF THE OCULAR MUSCLES, AND WHAT ARE THE INDICATIONS AND ADVANTAGES OF TENDON CONTRACTIONS?

Read in the Section on Ophthalmology, at the Forty-sixth Annual Meeting of the American Medical Association, at Baltimore, Md., May 7-10, 1895.

BY GEORGE T. STEVENS, M.D.

NEW YORK.

1. Technique of Tenotomies.—I have placed my views so clearly on record respecting the general technique of tenotomies that it does not seem necessary to repeat what I have said. There remain for discussion these two questions:

1. Why are slight effects produced as the result of free tenotomies of the ocular muscles?

2. What are the indications and advantages for muscle shortening?

In regard to the first question, the slight effects sometimes resulting from free tenotomies, I shall venture the assertion that a tenotomy uniformly produces all the effect which we have a right to expect from it. If we hope to produce a definite effect, by operating on a muscle which is not the chief element in the condition for which we operate, we may expect disappointment. In other words, we shall not get the effect for which we hope, if we operate on the wrong muscle.

It is necessary always to take into consideration all the reasons, all the conditions which enter into the anomaly for which the operation is to be done. All cases of esophoria, for example, do not of necessity depend upon any anomalous relations of the external and internal recti muscles. We may have, and indeed we do have, many cases of deviation or of deviating tendency of the visual lines inward which depend, not upon a false relation of the lateral muscles but upon too great tension of the vertically acting muscle. As to exophoria, I suspect that, as an essential and original condition, it is of much less frequent occurrence than is generally supposed. Indeed, to an important but not to the full extent, I may express my present view on this subject by repeating what I said in a paper on exophoria in 1889 (*Archives of Ophthalmology*, XVIII, pp. 4, 373), and in which I called attention to the fact that free tenotomies of the externi often produce less pronounced effects than might be supposed. I there gave as a reason, "that exophoria is not infrequently the expression of hyperphoria is a fact that can not escape the notice of the careful observer."

In the same paper, a thought which had more strongly impressed itself upon my mind than I was then ready to fully express, was stated as follows:

"When the relative physiologic power of the externi and interni are considered, we may well question whether exophoria is often a congenital defect." I did not then think that the available facts warranted any assertion, nor am I at present ready absolutely to exclude exophoria from congenital anomalies, but I feel warranted in saying that it is in every case safe to assume that it is an acquired condition, although careful consideration may at length lead us to adopt the view that a given case is an original and essential anomaly.

I have shown in papers which have been published from time to time during several years, how converging strabismus may often be relieved by proper relaxations of the overacting superior or inferior recti, and one who gives the subject careful study will be surprised to find how large a number of squinting people, squint in or out, not because of an excessive or of an insufficient normal tension of the lateral muscles.

I present here the photographs of two patients, each with marked converging strabismus; also a photograph of each of these patients in which it is plain to see that, whatever other anomalous condition may exist, or whether the best or the worst way has been adopted, neither of which questions is raised in this connection, a notable change has occurred in regard to the converging squint. In fact, it has been abolished; and yet in neither of these cases has there been the slightest interference with the lateral muscles, but in each case there has been a relaxation of both superior recti.

Now, let us suppose that in either of these cases a tenotomy of the internus had been done (as had been strongly urged by distinguished surgeons in both cases), is it not plain that a positive injury would have been done? But is it not also plain, and this is the bearing of these cases upon this question of free tenotomies and small results, that if these eyes were caused to swing in, by virtue of the action of the vertically acting muscles, no tenotomy of an internus, short of turning the balance of the eyes distinctly outward, would have served to prevent the inward squint? After such a so-called "correction," comes, very naturally, the gradual divergence so often seen after squint operations.

But there is in all this an element of great importance which has been generally overlooked, although I have called attention to it more than once. This free tenotomy which has caused so little apparent change in the appearance of the eyes when directed straight forward, has caused a marked, and generally an unfortunate disability of the eye to rotate in the direction of the free tenotomy.

Time, in this discussion, will not permit me to go into detail in regard to these conditions, but I may in a few words call your attention to some important truths.

An unfavorable direction of the eyes with regard to the horizontal plane, in which by virtue of a preponderating action of the upward or downward drawing muscles of one or both eyes, equally or unequally, an excessive effort is demanded on the part of the opposing muscles, predisposes to a drifting in or out of the visual lines according to circumstances. If the disproportionate tension of the vertically acting muscles is exactly equal, esophoria or esotropia usually results. If there is excessive and unequal vertical tension, exophoria or exotropia often results.

This being the case, it becomes a matter of the first importance that we determine not only the absolute but comparative rotations of the eyes, not only from side to side, but up and down.

We have had until quite recently no sufficient means for determining these rotations. The judgment which we may form by watching the rotations is not to be relied upon. The perimeter is destitute of any considerable value for this purpose.

The instrument which I show you here and which I call a tropometre, serves in this respect a valuable purpose. It consists essentially of a telescope in which the inverted image of the examined eye is found at the eye piece, where either as an aerial image, or as an image upon a ground glass, its movements can be accurately observed. A graduated scale in the eye piece permits every movement of rotation in every direction to be exactly measured. For the purpose of convenience in being near the patient and of presenting no obstruction to the light which should fall upon the examined eye, a right-angled prism or an obliquely placed mirror is adjusted at the distant end of the telescope, permitting the examination from the side instead of from the front.

Now, if we study the vertical actions of the eye muscles in connection with the lateral, we shall find that we have rarely, indeed, I think I shall not be betrayed into an exaggeration if I say that we have *never* to make very free tenotomies in any direction, for even in cases of extreme squint inward or outward, when we have accomplished the first stage of correction, which should be that of establishing equal and proper rotations up and down, there will remain so little to do that a complete tenotomy of an internal or external rectus muscle can never be required. In short, if we attend to *all* the elements which enter into the production of a lateral squint, instead of directing our attention exclusively to one muscle, and that generally the wrong one, we shall never have occasion for great operations.

Now let us turn our attention to the question of indications and advantages of tendon advancement.

The question turns first upon the purpose for which

the operation is to be done. If it is for the purpose only of "straightening a cross eye," which is the purpose so often, then I have no interest in its discussion. It makes little difference how it is done. It is a subject belonging neither to science nor to high art.

But if it is done with the definite and intelligent purpose of establishing binocular vision *at all normal points and under all normal circumstances*, we have a question of the highest scientific value and calling into service some most delicate and beautiful principles.

Many years ago I advised, when there appeared a necessity of making a very free tenotomy, to divide the effect between a moderate contraction of one muscle and a moderate tenotomy of its opponent, doing each upon both eyes, thus leaving the tension of the two opposing muscles as nearly as possible equal in sum to the original tension, but with the amount so divided as to bring about the desired effect. Superficially this appeared to be good logic and sound practice. As a matter of fact, it was neither the one nor the other.

We must recur to the principles which I have already discussed in regard to tenotomies. We must first ascertain exactly why an eye deviates in this or that direction; and then, if surgical operations are required, we should inquire whether the tensions are too great or too small. And, exactly here, upon the answer to this question, should the selection of a method be determined. How are we to know? Does the fact that, for example, in converging strabismus the eye rotates too far in and not far enough out, tell us what to do?

I know of but one method of solving the question absolutely. We may do this by the tropometre.

Let us, for illustration, assume that the temporal rotation should normally be 45° and the nasal 50° of an arc. This would give us the sum of a normal rotation in the lateral directions of 95°. Then, suppose that the upward rotation should be 40°, and the downward rotation 48°, the sum would be 88°. Now, should we find in a given case that the sum of these rotations should largely exceed the amounts given, it would be an indication for tendon shortening. I have found the percentage of these cases very small. The eyes of such people are usually, if not always, very prominent—almost goggled. The movements can be seen to expose large tracts of conjunctiva and the eyes swing in or out, according to the conditions of fixation.

By far the greatest number of those who have lateral deviations show no such excess of rotations. They are in the great majority restricted to three-fourths or even two-thirds of the normal rotations. To tie up such muscles and to increase the already excessive tension may be to improve the appearance of a patient; it certainly adds nothing in a rational way to an actual correction of the disabilities of rotation. I do not question the claim that eyes may be brought into closer relations in certain directions by such forcing, but I greatly question the wisdom of the method.

We may then sum up an answer to the questions which have been presented in a few words:

Free tenotomies have slight apparent effect when the muscle operated on is not the muscle at fault, and tendon contractions are advantageous only when they are directed against a condition of muscles positively shown to be loose, not by the failure of the eye to rotate in a single direction, but by a marked excess in the sum of rotations in opposite directions.

To draw a useful lesson from these few suggestions, I would say that a case of strabismus convergens or divergens is to be studied from the standpoint of the tensions of all the eye muscles, and that a very large proportion of these, and especially those of high degree, are the manifestations principally of vertical tensions.

If the rotation upward of the eyes, as shown by the tropometre is materially less than 40° or 45°, while the downward rotation materially exceeds 50° or 55°, no correction for the lateral deviation should be made until the rotation upward equals 40° and hyperphoria is absent. Or, if the upward rotation is excessive in comparison to the downward, an analogous correction is first to be made before an internal or an external rectus is cut.

If the rotations in all directions are evidently too great, indicating an absence of proper muscular tension, tendon shortening may be resorted to, which will be very rarely. If the sum of the rotations is not excessive, tenotomies only are called for.

33 W. 33d Street.

TO WHAT EXTENT SHOULD RECENTLY SUGGESTED SYSTEMS OF MUSCULAR EXERCISE DISPLACE TENOTOMY IN THE TREATMENT OF HETEROPHORIA?

Read in the Section on Ophthalmology, at the Forty-sixth Annual Meeting of the American Medical Association, at Baltimore, Md., May 7-10, 1895.

BY HIRAM WOODS, M.D.

BALTIMORE.

One's conception of the physiologic importance of an abnormality necessarily enters into his estimation of therapeutic measures. The wide difference of opinion upon the importance of heterophoria makes it advisable to state one's position before reviewing therapeusis. Briefly, I think heterophoria, like refraction errors, often is comfortably borne. Further, I am in accord with Dr. Duane[1] that we must find what heterophoria means. "Whether it is a spasm or paresis, accommodative strain or anatomic conditions that are the cause of the heterophoria." In some one of his papers Dr. Stevens has said that the surgical correction of a functional abnormality is a matter of grave responsibility. In a word, the whole matter is a question of diagnosis, and a mistake may be very serious. Exophoria is not always weakness of the interni. The same is true of faulty tendencies in other muscles. Free tenotomies sometimes produce slight effects, and careful tenotomies sometimes produce disastrous and great effects. The surgeon who escapes such an experience is to be envied. In 1893, Dr. Savage[2] gave out his "Rhythmical Exercise." At the Pan-American Congress in September of the same year, Dr. Gould told us we had "all been on a surgical debauche," and followed his indictment with his treatment based upon the theory of "Innervational Abnormalism."[3] It was interesting to note the avidity with which these measures were seized upon where these distinguished writers have established influence. From the South and West came cures by rhythmic exercise when everything else had failed.

[1] Annals of Ophth. and Otol. July, 1894.
[2] Ophth. Record, May, 1893.
[3] Medical News, Nov. 18, 1893, and Annals Ophth. and Otol. Jan. 1894.

Around this neighborhood, "handicapping by prisms" reigned supreme. The meaning of it all was that there is a widespread conviction that tenotomy is not always a safe remedy for heterophoria, nor the balance test the whole diagnosis. Personally, both measures appealed to me as rational. I have never felt that it was in accord with scientific work to restore muscular balance by weakening the stronger muscle. To bring the weak to the physiologic standard of the strong seemed the correct procedure. This is what these plans proposed to do. Again, I had met cases where, with faulty tendency by equilibrium test, there was wanting what Dr. de Schweinitz[4] gives as a necessity for tenotomy, "distinct preponderance of the opposing muscle." In looking for this preponderance, with esophoric balance, the variableness of adduction had led me to abandon it as a test. I was satisfied that adduction was nothing more than positive relative range of convergence, and largely a matter of cultivation; moreover that it bore no constant relation to balance, for with high exophoria it was often high also. This bit of observation, with the influence of certain writers, had led me into an error, which, I believe, is common. I mean the extension to abduction of the same reasoning applied to adduction. The latter is variable, can be easily increased in a variety of ways, and bears no constant relation to the distance equilibrium test. It has a connection with accommodation of uncertain and variable nature. None of these, it seems to me, are true of abduction. It varies, if at all, within very narrow limits; it is rarely, and with difficulty, increased by any system of exercise with which I am familiar; it has no necessary physiologic nerve connection with another function, from which the patient must learn to divorce it; in a word, it forms, with distance equilibrium test, and associated refraction, the keystone of diagnosis. It is, I believe, always low when esophoria means intrinsic weakness of the externi, always high when exophoria demands surgical treatment. In either esophoria or exophoria, without low or high abduction, there is something else; and a tenotomy before this something is discovered is a hazardous undertaking.

Answer to the title question must come through answer to another: What does clinical experience teach can be accomplished by the two methods of exercise mentioned? and, farther, it is to be remembered that faulty lateral balance does not always mean intrinsic muscular weakness. At the hands of Drs. Duane[1] and Eaton,[5] Dr. Gould's plan has undergone investigation from the standpoints of originality, physiologic correctness of nomenclature and usefulness. Each of these writers thinks that the method is an adduction developer; a promoter of positive relative convergence. Of this there can not be the slightest doubt. Adduction can be doubled or tripled often in five minutes. So far, then, as defective adduction causes exophoria, it is a remedy for exophoria. In its clinical use I note: 1, adduction when low can be developed most rapidly when associated with low or normal abduction (3° to 8°). This condition is not true interni weakness, although the balance test is usually exophoric. It is only inability, from causes little understood, to separate convergence from accommodation. 2, defective relative range of convergence may cause asthenopia. By way of illustration:

[4] Diseases of the Eye, p. 544.
[5] JOURNAL AMERICAN MEDICAL ASSOCIATION, Sept. 1, 1894.

Case 1.—Student 21 years old. Asthenopia on near work. Refractive condition Hm+1 D., Ht. under homatropin, +1.5. Muscles; at 20′, exophoria 1°, Ab. 3°, Ad. 10°. Near exophoria 10° with naked eye, 14°, with Hm. corrected. Gould's method raised adduction to 24° in five minutes. Allowing a normal excess of exophoria for the near over the distance balance of 2°, there was left a near exophoria of 11 prism degrees, or 3 meter angles. This was 1.5 m.a. for each eye. In other words, the muscular error for the near, corresponded exactly to the accommodation in dioptres for distant vision. Hm (1 D.) was ordered for constant use, and Gould's method continued for a few days. Adduction was easily developed to 30° and stayed there. Behind the glasses, near exophoria fell in three weeks to 3°.

I noted this same condition in another case, a medical student 23 years old. He had Hm+0.5.D., Ht.+1.25. Muscles, at 20′, exophoria 1°, Ab. 4°, Ad. 14°. Near exophoria 11°. Prolonged work was an impossibility. The calculation for meter angles shows nearly the same relation to H. as in Case 1. Gould's method made adduction 30° in a few minutes. It was continued for a few days, and the Hm. was corrected. Behind these glasses, near exophoria fell to normal in three weeks.

Three possible causes of the asthenopia suggest themselves: 1, hyperopia. Uncomplicated hyperopia of 1.5 D. total in healthy young men, with p.p. acc. of 6 or 6.5 cm. is not apt to produce asthenopia. 2, the low abduction. Convex spherical glasses are often of great service in weakness of the externi. In such cases, however, there is usually low exophoric balance at 20′, with either the same or orthophoria in the near. High near exophoria is not a symptom of this condition. 3, defective relative convergence. The usual near balance is 2° to 5° in the direction of exophoria, compared to distance balance. Dr. Noyes[6] thinks this is not abnormal. Dr. Theobald[7] had developed from it a useful method of diagnosing accommodative asthenopia in young persons. In each of the above cases the excess of near exophoria, over this normal, equalled the difference between A and C imposed by refraction error. Under exercise which broke up the hard and fast artificial connection between A and C, symptoms disappeared, and near exophoria gradually lessened behind *convex* glasses; just the opposite of what is usual. The conclusion seems justifiable that defective positive relative convergence was the cause of asthenopia. I have treated similar cases with abducting prisms for near work. Such a course is often successful, but it only treats a symptom. Gould's method breaks up the cause of asthenopia, and refraction correction prevents its return.

A third note I make for the clinical use of Gould's method is that in exophoria, with high abduction, development of adduction, without attacking the overstrong externi, sometimes relieves. In the case of a man 21 years of age, without refraction error, and with asthenopia, I found exophoria at 20′ of 1° to 3°, Ab. 10°, Ad. 12°. Near exophoria 9°. It took several days to develop adduction to 30°, but then a cure was effected. Exercise was continued for several weeks. Apparently this was a case where the intrinsic muscular error, overstrong externi—was easily carried as soon as the interni were taught to work. In favor of this method, the above is all I can say. In esophoria it has failed me utterly. Abduction has not increased. In one case of hyperphoria it seemed to do good; but it is distinctly inferior to Savage's rhythmic exercise. In exophoria with high abduction, it has only exceptionally relieved asthenopia, though it developed adduction from 10° or 15° to 50° or 60°. The trouble was excessive ex-

[6] Diseases of the Eye, Edition 1890, p. 195.
[7] Transactions Am. Ophth. Soc., 1891.

ternal contraction. In several such cases I have had to order abducting prisms or do external tenotomy. Still, the method was useful as a diagnostic means, to throw the responsibility on the strong externus, and acquit deficient adduction. Some one I think advocated its use after external tenotomy. This seems rational.

Savage's rhythmic exercise has not received, in this part of the country, the attention it merits. It is, as Eaton [5] has said, a physiologic method of strengthening muscles. I have had considerable experience with it, using for esophoria prisms from 3° to 5°, and for hyperphoria from 1° to 2.5°. These are a little stronger than originally advised by Savage. I value it highly in these classes of cases: 1, in hyperphoria, usually of low degree, where supra- and infra-duction are not far apart; for instance 2° to $2\frac{3}{4}$°, 1° and 1.5°, etc. This form of muscular error, is I believe, quite a common source of asthenopia. For my own part, I want a bigger margin than 3-4° when cutting a vertical muscle. 2, in low esophoria, with abduction of 2.5° to 4°, unrelieved by refraction correction, it has in a few cases developed abduction a little. It is, however, confessedly slow and such cases do better, it seems to me, with adducting prisms. 3, when opposite muscles are deficient in contractile power, irrespective of balance test; for instance, a condition like this; esophoria 2° with Ab. 4°, Ad. 12°, developing hardly at all by Gould's method, and no light thrown on the matter by near test. Such cases are not frequent but they occur, and are due to general muscular asthenia.

Rhythmic exercise seems to me the only rational treatment we have. In the case from which the above measurements were taken, it gave excellent results. As a developer of adduction it is slower than Gould's method.

To answer the title question, I would conclude that: 1, Savage's rhythmic exercise should displace tenotomy in the treatment of low hyperphoria, when supra- and infra-duction are not over 1° to 1.5° apart; 2, when, irrespective of balance, all the muscles are wanting in contractile power; 3, when a weak externus, with only 3° or 4° abduction, (5° being regarded as the normal minimum) seems to cause trouble, and there are wanting the conditions which make internal tenotomy justifiable.

I would conclude that Gould's method will: 1, almost certainly give relief in the considerable class of cases where exophoria and low adduction exist without high abduction; 2, that even when exophoria is associated with high abduction, adduction should be developed by Gould's method before operating, to determine whether it is excessive externus or defective internus action that is causing asthenopia.

In esophoria with low abduction, or hyperphoria with a difference in vertical duction of 3° or more, refraction correction or prisms, bases toward the weak muscles, having failed to relieve, operation is as a rule necessary. The ideal treatment for heterophoria, due to intrinsic muscular weakness, is a system of exercise which can be depended upon to develop very weak muscles to the strength of their antagonists. It has not yet been discovered, so far as I know.

816 Park Avenue.

Dear Doctor:—Please direct the attention of your friends to *our* JOURNAL. We will be pleased to send sample copies to any names you may suggest.

ELECTRO-VIBRATION OF THE TURBINATED TISSUE.

Read in the Section on Laryngology and Otology, at the Forty-sixth Annual Meeting of the American Medical Association, at Baltimore, Md., May 7-10, 1895.

BY J. MOUNT BLEYER, M.D., F.R.A.M.S.

Member of the Royal Academy of Medicine of Naples, Italy; Corresponding Member to the Academy of Medicine of Mexico; Corresponding Member De La Societié D' Electrotherapie, France; Member American Medical Association; Surgeon to the New York Throat and Nose Hospital; Surgeon to the German West Side Clinic; Medical Editor Electrical Review, Electrical Society, New York City, etc.

NEW YORK.

In this paper I shall attempt to present the useful purpose of faradism, as observed by me, in treating this form of disease involving certain conditions of the turbinated tissues, which from time to time we have been treating according to the prevailing fashion of the moment, now medically, then again by the more radical means of surgery, the cautery, the saw, the snare, involving a tissue destruction to which, in some instances I have been for a long time opposed; and which I also availed myself of in the hope that some day I would hit upon a better plan of procedure, more physiological and less often accompanied with results ranging from beneficial to positively bad, if not, to say the least, lastingly harmful.

I believe, from the results of two hundred cases treated by the method as I shall describe without going into the details of each individual case, I have found a method for the treatment of simple hypertrophied turbinated tissue that is far better than either the medication treatment or surgery, or both combined. It is faradic massage.

The time has come when those of us who have given years to the careful study of the curative power of electricity must plead for tolerance among our colleagues, and an impartial hearing. Electricity has many uses, and I am sorry to say many abuses, which in no few instances come from so-called specialists, ranking high as leaders in the slowly growing science of electro-therapeutics.

Electricity is like copaiba in emphysema, a good remedy in bad company.

The good account faradism has rendered of itself in this instance is due to the fact that we have studied and carefully observed its physiologic action and have just begun to bring it under the control to which all remedies are subject, that of intelligent dosage. This has been rendered possible by the recent improvement in faradic machinery.

By means of induced currents (faradic electricity or interrupted current) very powerful currents can be obtained, but currents which only last a short period of time. If we wish to apply the induced currents therapeutically or for experimental purposes, we must find means of generating them in quick succession. An apparatus for this use is called induction apparatus or a faradic battery. To be more explicit: the essential parts of an induction current machine are spirals with iron cores, which are moved quickly past magnetic poles. An ordinary faradic apparatus would then consist of a primary coil, having an iron core, and a secondary coil which is wound over the primary coil. Through the primary coil a galvanic current is passed, the make and break of which follow rapidly upon each other. In order to produce this phenomena which is necessary for the rapid interruptions of the current in the primary coil, an automatic circuit break is provided. This may be simply

a vibrating armature of an electro-magnet, alternately energized and de-energized, which armature in vibrating alternately makes and breaks the primary circuit. Such arrangements are usually in small induction coils.

The three illustrations below inserted explain the principal points regarding the construction and physics of an induction machine. (Fig. 1.)

1. Illustrates a galvanic current which sweeps around the primary coil C.′ while (*a*) converts the core into a magnet, N.S. and (*b*) induces a momentary reverse current in the secondary coil C.′′

2. The sudden magnetizing of the coil itself induces a reverse current in the secondary coil, which strengthens the galvanic induced current within this circuit.

3. The magnetized coil attracts the soft iron head of the spring to itself, and so breaks the current flow.

4. This stopping of the current flow stops the magnetizing influence upon the core, and a direct current is induced in the secondary coil by the breaking of the primary current, strengthened by that induced by the de-magnetization of the core.

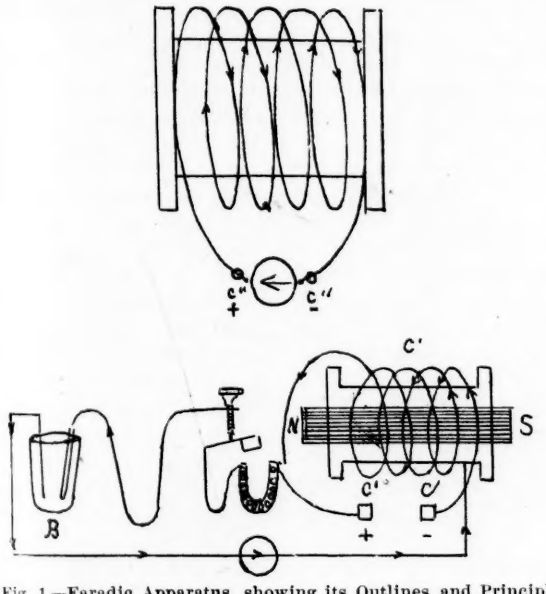


Fig. 1.—Faradic Apparatus, showing its Outlines and Principle of Construction.

5. The magnetic force holding the hammer being removed, it returns by another current, passes, and by these vibrations the process is repeated in such rapidity as the strength of spring and magnet admits.

Definition of Induction.—What is induction? What are induction coils? By common consent this term is employed as a name for an apparatus invented by Munson and Neef and subsequently by M. Ruhmkoff, consisting of a bobbin wound with a short coil of stout wire, over which is wound a secondary coil of very fine wire of many thousand turns, well insulated from each other, the whole fitted with a central core of iron. The name is not happily chosen. It should have been inductive coils, since the word "inductive" means "leading, persuasive, producing," and the use of these coils is to produce a high tension electric current from one having a low tension. The term inducing coils, would have been still more correct since inducing is part of the verb induce, a word meaning, "to influence, to persuade, to actuate, to impel, to allure." The appropriateness of these terms to the electrical instrument under consideration will be seen as we proceed in explaining the principle of their construction, and their mode of action. The word "induction" on the other hand, comes from the verb "induct" which means "to introduce, to bring in, to put in possession;" none of which apply appropriately to the action of the inducing or inductive coil. Now scientists have given different definitions for the term "induction," but most of them are not clearly defined. Perhaps it will be more easily understood if put in the following words:

THEORY OF INDUCTION.

Every theory respecting induction is based on the assumption that there existed two electricities, one positive and the other negative, both of which were fluids. The fluid theory has been abandoned by electricians, because modern observations of electrical effects have rendered the theory no longer tenable. The other theories of two electricities, that is, two kinds of the same thing, such as positive and negative, answering to the terms male and female, is also fast passing away. We still speak and write of electricity as being positive and negative, but we use these terms most to distinguish the backward or forward movement of the current, than to employ the existence of two separate and different forms of energy. Some of the newest theories respecting induced currents of electricity are based on the assumption that all bodies are enveloped in a fluid, to which the name of ether has been given. The electric current, in passing through a conductor, disturbs the arrangement of its component parts and these in turn are said to disturb the ether, which then transmits the disturbance to contiguous bodies. Whether this theory is based on fact or on fancy we can not here determine, but the fact remains that there is such a disturbance set up in bodies near to electric conductors, and these are especially observable at the instant when the current of electricity is interrupted, as when the electric circuit is broken. The observed effects go to show that the interruption causes a kind of eddy or back-wash in the current, which is felt by other bodies susceptible to its influence and observed in them as a current flowing in an opposite direction to that of the inducing current. The inducing effects are more strongly shown in conductors actually in contact with the insulating substance; but they are also observed in conductors separated by air spaces only from the inducing conductors. This goes to show that either the air or some similar invisible conducting medium transmits the inducing effects of one conductor to another conductor

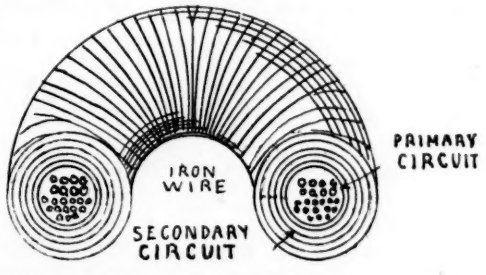


Fig. 2.—Section of ring-shaped Secondary Generator or Coil.

PRINCIPLES OF INDUCTION.

Before we proceed further in the study of the induction or inductivity, it will be advisable to

notice a few of the principal facts or laws governing its action. These, when well understood, will guide us regarding the construction of coils and the faradic machine, or induced current apparatus.

The inducing conductor and the conductor to be induced must run parallel, side by side. The inductive effect is weakened when they cross each other, and may be neutralized by a transverse position. The bare conductors must not touch each other, but must be separated by an insulating medium. If two conductors are in contact at any part of the circuit, or are insufficiently insulated, they combine in forming one conductor conveying the primary current in one direction only, and consequently there will be little or no inductive effect observed. The turns of the conducting wires of a coil should not only be wound regularly, side by side, to get the best effects, but should also lie close to each other, separated only by the thin insulating medium.

Since each turn exerts an inductive influence on its neighbor, and this influence is weakened by over-insulation and want of continuity, it will be seen further on, when we consider the relative values of insulating mediums, that the best of these are conductors of electricity, when the tension or pressure of the current is sufficiently high to overcome their resistance. Therefore in planning the insulation of the wires and the parts of a coil, regard must be had to the tension of the current employed in working it, for if we employ a current of higher tension on an imperfectly insulated or badly arranged coil, with a view to obtaining better effects from it, the extra current forced through the coil will overcome the resistance of the insulation and break it down.

Whenever this occurs in a coil, the inductive effects cease because all the imperfectly insulated turns are absorbed.

The inductive effects of a current are observed, at least these manifestations:

1. When the insulated conductor is wound as a wire around a mass of soft non-magnetic iron, the current of electricity passing through this conductor induces magnetism in the iron and converts it into a magnet while the current is passing. The effect here manifested as magnetism only exists while the current is passing through the conductor, and when the current is broken.

2. When the insulated conductor is doubled on itself, or wound into a spiral or made into a coil with or without a core of soft iron, the inductive effect of one turn of wire on another is manifested at the terminal of the battery or other generator of electricity (when the circuit is broken) by a bright spark, which increases the brightness with the turns made by the wire. A similar spark is observable at the terminals of a wire around or laid parallel to the conductor in the main circuit, when the necessary conditions are present. This effect is only observed at the instant of breaking contact with the battery, or, in other words, on the instant of the rupture of the main circuit wire.

3. When a wire is thus made into a long spiral with several coils close to each other, and the bared metal parts near the battery terminal are held in the naked and moist hands of a person, that person will experience a tingling sensation in the nerves of the fingers at the instant when the current is broken and also when contact is made again with the battery. This manifestation of induction is also only momentary, but can be repeated as often as contact is made or broken. When a long coil of fine wire is wound on and over the main coil, the tingling sensation can be felt at the terminal of the second coil when contact is made or broken at the terminal of the first coil.

There are, therefore, three distinct manifestations of electric current induction, or the inductive effect of the electric current observable, viz., the magnetic, the calorific and the physiologic. All these three effects can be found, described, and its experiments shown in detail in all works on physics.

SOME OF THE PHYSIOLOGIC ACTIONS OF INDUCED CURRENTS.

The duration of induced currents has marked influence upon their physiologic effects. The constant current of a battery only affects our system when a great many elements are used, and the weaker constant currents only affect very sensitive parts; our nervous system, however, is very sensitive to rapid electric changes. The induction current, therefore, produces far more powerful shocks than the primary current, because the duration of the former is far shorter than the duration of the latter. The difference of duration in induced currents when massive cores or bundles of wire are introduced in the coil, explains the marked difference in their physiologic effect. By introducing solid matter, the duration of the induced current is increased; by introducing a bundle consisting of many fine wires, the duration of the induced current is lessened, therefore the physiologic effect is far more powerful; this has been proved to us by Magnus beyond a doubt, and bears important relation to the action of such an induced current in its physiologic action. The effects which are produced in general in any given cases under treatment by electricity are: stimulating and tonic effects, general and local; these belong to both galvanism and faradism, but especially to the latter, which acts as a stimulus, partly upon the contractile tissues, both directly and through their motor nerves, partly by its sensory nerves and partly in a reflex manner through the vasomotor system, producing increased vascular activity in the parts which it reaches. These effects are, to a certain extent, shared by other modes of stimulation, as for instance, by massage, by treatment with hot and cold douches followed by friction with a rough towel, etc.; but electricity has certain advantages over these active modes of stimulation, especially in all paralytic affections, from its greater power of inducing muscular tissue construction, and by its vibratory and stimulating action upon the nerve filaments for quite a distance of their length, and from the ease with which it can be directed to any required parts or centers in the body.

The effect which peripheral stimulation exerts upon the central organs plays an important part in electrical treatment and affords the best explanation of the benefits which follow, even in cases where the treatment has been applied to the peripheral parts only.

THE DIRECT EFFECT UPON THE SENTIENT NERVES BY THE INDUCED CURRENT.

The healthy sentient nerves, which are the nerves of sensation, are observed by the aid of the microscope to be arranged in their peripheric termination much like fine moss, or the pile of fine uncut silk velvet. If this vibratory action of the induced currents is brought to bear upon the nerves in the nose, the

sensation received by the membrane during the passage of the current is as if painfully scratched.

The induced current in a given bearable quantity and intensity has a greater effect upon the sentient nerves, in proportion to the frequency of the interruption of the current, *up to a certain degree*—which, for instance, may be about all the nerves can bear; but if the vibrator on any machine is screwed up a trifle, so as to make the interruptions extremely fine and rapid, then the current is more easily borne, and not only so, but it then becomes almost or quite pleasant. But I am of the belief there is in this case more indirect effect, *i. e.*, reflex action, because this current more nearly resembles the continuous galvanic current. A pretty rapidly interrupted current has more effect on the sentient nerves than very slowly interrupted currents, because it is the law of their action to feel or retain the effects of an impression for some little time after being acted upon. So where a sentient nerve that is in health is subjected to the action of a single blow of an induction current, if of low tension, there is almost no sensation; but if these blows or shocks are then repeated faster and faster, the sensation will likewise increase, because the sentient nerve is not now in its normal state, *i. e.*, when it receives the second and third and succeeding shocks, but is in an excited condition.

There is no doubt that the rate of vibration is one of the most important factors in determining the therapeutic effect of the induction current, and not merely as it was formerly treated, a mechanical necessity for the production of such currents, and a very secondary part in the apparatus, as it has always been and still is in all faradic instruments. However, regularity of vibration or interruption is essential to a serviceable therapeutic current and to obtain this we must not only have an interrupted action with far greater regularity than the old-time vibrator as ordinarily constructed, but, in addition, the vibrator must be controlled by a separate force entirely distinct from the coil current, as it is in the apparatus.

The remarkable results of vibratory action have been sufficiently demonstrated of late, and the varying effects of such vibration of various mediums upon different nerves are the subject of physiologic and therapeutic experiment. The more varying the effect of different rates of vibration, the more important is their perfect control. The increased rapidity of interruption and the ability to control it gives a wide scope to the efficiency of the current, increases its sedative power, and renders the application of effective currents possible to the most sensitive tissues, certain results, especially decided vasomotor effects, being produced by rapid interrupted currents which are no longer perceptible to the sensory nerves.

Dr. Engelmann and myself have placed two new appliances constructed on similar principles, mine having some other advantages which will hereafter receive extra description, capable of giving us high rates of interruption, together with a perfect control of those interruptions. Vibrations from 1 to 100,000 per minute are obtainable. I am also of the same belief with Dr. Engelmann that 50,000 interruptions to the minute is ample for all therapeutic uses in connection with the primary and secondary coils as now used in practice. By the use of these mechanical devices, the rapid interruptions which they give are a most valuable means placed in our hands. We can employ strong efficient current without discomfort.

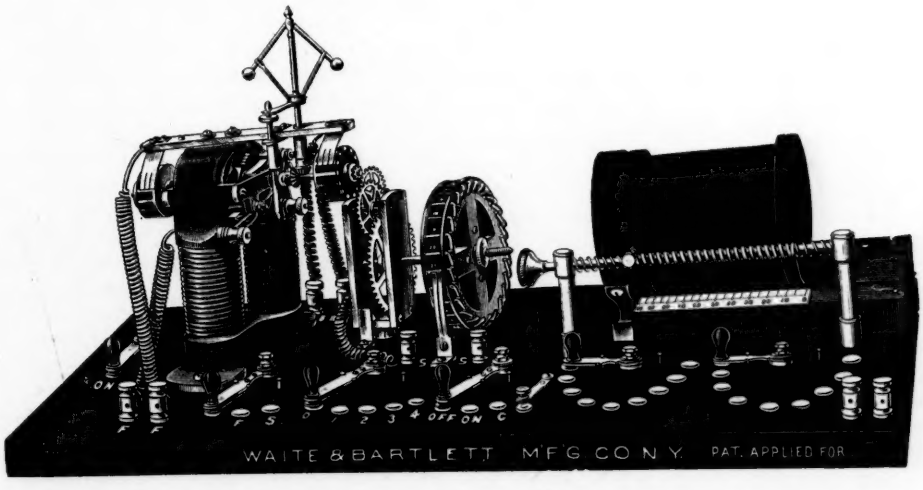


Fig. 3.—Engelmann's New Faradic Machine, with Variable and Controllable Interrupter and Alternator, of High Tension.

Electro-vibratory massage is the art of applying an intermittent, induced or interrupted current—(faradic electricity) with a specified amount of makes and breaks—periods or interruptions by means of an electrode directly to the hypertrophic turbinated tissue within the nasal cavity, or other parts to be treated by this method. As a contrast to electro-vibratory massage usually spoken of, is the act of applying intermittent pressure and strain to the muscles and other accessible tissues. The means employed are rubbing, kneading and light pounding, combined ordinarily with more or less additional stimulation of the skin—as by the friction and slapping. This manipulation furthers the removal of lymph from the parts, which is especially needful when the lymphatics flow is sluggish through lack of muscular exercise; it apparently quickens the blood circulation through the part and furnishes gentle vasomotor exercise; it acts possibly as a direct trophic stimulus to muscular and sustentacular tissues; by stretching the ligamentous structures it maintains or increases suppleness; in the abdomen it stimulates and aids peristalsis and as a general

stimulation of sensory nerves it may affect favorably the nutrition of the central nervous system.

In the foregoing part of this paper, under the heading of the physiologic actions of the induced current, I have rehearsed in detail the effects and therapeutic value.

It has demonstrated itself to me in all cases that electro-vibration acts directly on the part undergoing the vibration. It influences the circulation in the veins and lymphatics, and at the same time acts as an anesthetic where congestions are present, as in acute and chronic inflammations, which will at once make itself evident to the operator. The gross physiologic action by applying these high rate vibrations to the turbinated tissues is simply hastening the absorption of the inflammatory processes, and thereby reducing the size of these bodies which occlude the meatuses.

By this system which I have been practicing for ten months and applied in over two hundred cases, I can only say that results are most satisfactory to myself and to my patients. A very important effect is noticed by the patient immediately after the first séance, that the turbinated bodies have been reduced and breathing is possible through the meatus which previous to the application was occluded. The secretions are more abundant and the entire head has a feeling of clearness, which is due to the reduction of the tissue, emptying of blood vessels and lymphatics,

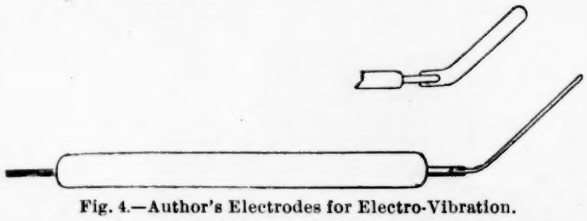


Fig. 4.—Author's Electrodes for Electro-Vibration.

and the effects of an impression left by the high speed interrupted current on the sentient nerves for some little but appreciable time after being acted upon. Different sensations are felt by different individuals—as pinching, prickling and, most often experienced, a burning sensation as above described. These are most of the physiologic and clinical facts connected with electro-vibration, which I tried to describe as graphically as possible.

Cases must be selected for the treatment by this method.

THE PRACTICAL PROCEDURE OF ELECTRO-VIBRATORY MASSAGE.

For example, let us take a hypertrophied inferior turbinated body of the left side of a patient, to operate on; the physician must be fitted out with a proper plant, viz., a first class induction machine, capable of giving no less than from 4,000 to 6,000 interruptions per minute or more. I use generally 10,000 to 15,000, produced by the Engelmann or author's interrupter.

Electrodes of different diameters and curves. These are the chief instruments for the proper carrying out of this form of vibration. The patient is seated before a reflecting mirror, with the head in a comfortable position. A speculum must be used in order to apply the electrode over the body or tissue to be treated. When the electrode is once placed over the hypertrophic turbinated body, the current is slowly graduated in strength, with the high speed of interruption at once. Allow the electrode to remain in one position over the tissue treated for the entire séance. Do not reintroduce the electrode without stopping your current, or your patient will receive a shock, which is to be avoided; but start as you began, by turning on the graduated or tolerant current with its high speed frequencies, each sitting to last from twelve to fifteen minutes and repeated daily, for the first week, and every other day after that.

If the patient is sensitive about the nasal cavities, a 5 per cent. solution of cocain is advisable. Regarding the time in which cures are effected, that varies according to the extent of the hypertrophy. Some are cured in from ten to twenty sittings, or from six to eight sittings. Every case must be individualized. No set rules can be laid down.

It is best to start on the inferior turbinated tissue first, in order to give room to the traveling of electrodes. All obstructions to the entrance of the electrode must be removed previously. Some patients will be found very sensitive in the beginning, to the induced current. This is also noticeable with all other forms of massage employed in this cavity. The current travels the sensitive distributed nasal nerves which can not be avoided. You will often find in the beginning of the first few seconds of treatment, the patient wishes to have the electrode withdrawn, but soon submits and thinks no more of it. Should much resistance on part of the patient exist, cocain will relieve all reflexes.

After each sitting, a strong solution of alum dissolved in albolen, or some other compound of its kind, is applied to the massaged parts and well rubbed in by means of a probe wound with cotton. In children, where the inferior turbinated tissue is found, as a rule, hypertrophied, electro-vibratory massage has given the best account of itself.

There are no contra-indications for the use of this method. I have used it in all forms of disease about the pharynx and nasal passage and recommend the same to my colleagues.

The electrode, of which a cut is here given, is one of the many used for the application of this treatment. In some cases it is admirable to use soft material, as sponge and cotton, fixed into a conducting holder.

460 Lexington Avenue.

ELECTROLYSIS BY A CURRENT CONTROLLER FOR THE REDUCTION OF SPURS OF THE NASAL SEPTUM.

Read in the Section on Laryngology and Otology at the Forty-sixth Annual Meeting of the American Medical Association, at Baltimore, Md., May 7-10, 1895.

BY W. E. CASSELBERRY, M.D.

PROFESSOR OF THERAPEUTICS AND OF LARYNGOLOGY AND RHINOLOGY IN NORTHWESTERN UNIVERSITY MEDICAL SCHOOL (CHICAGO MEDICAL COLLEGE); LARYNGOLOGIST TO WESLEY HOSPITAL, ETC.

CHICAGO.

It is unnecessary to describe spurs or excrescences of the septum narium further than to say that they are outgrowths of cartilage or bone, or of both combined, which project from the septum into the lumen of the nostril, thereby causing obstruction to nasal respiration and drainage. In size, contour and exact location they are of infinite variety and the symptoms which they produce vary correspondingly in nature and degree, being at times so grave as regards complete occlusion, deformity, pressure effects, and

the induction of neuroses, as to demand removal by whatever means, and again occasioning merely a sense of inconvenience or annoyance. Customarily, excrescences are removed by surgical means, by the knife, saw and drill, and these methods are still to be indorsed for the majority of cases. In skillful hands they are more rapid, more precise, and in the case of large bony spurs, it would seem, more effective than is electrolysis. But the surgical method is sanguinary, and while many patients bleed but little, a considerable number suffer from profuse and troublesome hemorrhage and there is no way of telling in advance which ones will bleed, or when they will bleed. Such cases usually demand packing of the nostril, either at once by the operator or by any accessible physician, if the hemorrhage occur later, as during the following evening or night, and the packing if not done with antiseptic material can lead to infection of the middle ear and this in turn to suppuration in the mastoid process.

It is true that both profuse hemorrhage and infection can be avoided with reasonable certainty by the insertion in all cases, immediately after the operation, of an antiseptic packing of iodoform gauze, or by the closed treatment of the nostril by the antiseptic method of Roe, either of which, however, subjects the patients to some inconvenience and annoyance and causes sensitive ones to interrupt business or seclude themselves for a day or two. Neither the danger of possible hemorrhage nor the inconvenience of a tampon is comparable to the benefit conferred by the operation in a case of major degree, but they do seem disproportionate to the ends sought in many cases of minor degree. For these reasons, others, as well as myself, have sought in electrolysis at least an occasional substitute for the knife.

Concerning the physics of electrolysis, it is only necessary to state that it is a process of chemic disintegration of tissue under the influence of an electric current by which water and salts are separated into their component parts, oxygen and acids being attracted to the positive pole and hydrogen and the bases to the negative pole.

A resumé of the previous literature of the application of electrolysis to the treatment of nasal spurs need be but brief; most of the publications have been in French, are recent, and have not been freely circulated in this country. Miot[1], of Paris, was the originator in 1888, and following him Garel[2], of Lyons, reported his results in thirty cases, but my attention was first drawn to the method by Moure[3] at the Ninth International Medical Congress at Berlin in 1890, where he read an elaborate paper on the subject and described minutely the technique. Moure and Bergonie[4] have since embodied their studies in a monograph published in Paris in 1892, and Moure[5] again in 1894, before the Eleventh International Medical Congress at Rome, discussed in a paper the "Comparison between Electrolysis and other Methods of Treatment for the Destruction of Deviations and Spurs of the Nasal Septum."

Moritz Schmidt in his book, "*Die Krankheiten der oberen Luftwege*," published in 1894, confirms the efficacy of the method as advanced by the French operators, a significant fact which goes far toward removing the sense of skepticism with which the subject was first viewed in America. Among others may be mentioned Peyrissac, Meyer and Heryng, all cited by Newcomb.

Only two papers by American authors have come under my observation. One by Newcomb[6] of New York, with a report of two cases and an excellent review of the bibliography and technique; the other by Ballenger[7] of Chicago, with a report of three cases.

All of these operators have employed, as the source of the electricity, a primary galvanic battery of about 30 cells. The supposed necessity for this troublesome and unreliable apparatus has prejudiced many against the electrolytic method. Allowed to stand unused for a time, it is often found that the acid fumes have corroded the metallic parts and the battery fails to work, or the cups leak, or the liquid slops over, or it otherwise exhausts one's time and temper. To obviate these annoyances would mean to enhance the utility and availability of the method by electrolysis, and I therefore present this preliminary report of the results which I have secured by the use of the Edison electric light circuit and the McIntosh current controller.

The Edison current is characterized by the conditions best adapted to electrolysis, that is moderately high tension or voltage, the volt being the unit of electro-motor force, and comparatively low current strength or amperage. The Chicago Edison current has an E. M. F. of 110 volts, or about double that of a battery of 50 Daniells cells, one Daniells cell being selected as the standard, having an E. M. F. of 1 volt. The amperage depends on the amount of resistance in the circuit and it is so reduced by the resistance of lamps, controller, and human tissues as to be measured in milliampères or thousandths of an ampere. The current strength necessary for electrolysis of nasal spurs is from 15 to 25 milliampères, measured with the resistance of the spur in the circuit, and to supply this current from fifteen to twenty-five cells of a galvanic battery would ordinarily be used with a corresponding E. M. F. of from 12 to 20 volts or more. It is evident, therefore, that the Edison circuit, while correct in kind, is far too intense in degree and must be reduced.

Mr. Neiswanger, electrician to the McIntosh Battery & Optical Company, on request, has furnished the following description of the current-controller which I have used:

"The controller works on the 'shunt' principle. The machine circuit consists of a succession of coils, nineteen in all, joined in series and having a united resistance of 209 ohms. The patient may be placed in a shunt to one or more coils. The coils vary in size, but are so proportioned as to modify the voltage in tenths and hundredths. The sliding contacts are arranged in two rows. The one on the left is connected with the larger coils, and consequently each coil in this row divides the E. M. F. in the machine circuit by ten. The one on the right is connected with the other row of contacts, and each coil divides the E. M. F. by one hundred. The two rows may be used singly or together."

The accompanying diagram illustrates the essential parts of the instrument:

To elucidate: the controller is so constructed that if placed in direct connection with the 110-volt circuit, and the left-hand or decimal slide be advanced to 1, enough coil resistance is removed to

[1] Revue Mensuelle d'otologie et de Laryngologie, cited by Garel. (Loc. cit.)
[2] Annals des Maladies de L'oreille, du Larynx, etc. Tome XV. 1889. pp. 638.
[3] Verhandlungen des X Internationalen Medicinischen Congresses Band IV.
[4] Du Traitement par Electrolyse des Deviations, etc., Paris, 1892.
[5] The Journal of Laryngology, Rhinology and Otology, May, 1894.
[6] Medical Record, Aug. 5, 1893.
[7] The JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION, Nov. 10, 1894.

secure a current intensity of .1 of 110 volts, equal to 11 volts. In like manner, if advanced to 2, .2 of 110 volts is secured, equal to 22 volts. If, now, the right-hand or centesimal slide be advanced to any given contact, say 4, there will be added .04 of 110 volts, or 4 volts, equal now to 26 volts.

But the decimal division of an initial 110-volt circuit is still too painful on advancing the contacts, so I have resorted to the expedient of placing a 16 candle electric lamp in the circuit ("in series") the resistance of which reduces the original E. M. F., aside from the action of the controller, to an initial current of 55 volts, or sometimes of placing two lamps in series in the circuit which reduces the initial current to 27 volts.

The result is that, with one lamp in the circuit, on advancing the decimal slide of the controller to 1, enough coil resistance is removed to secure a current of .1 of 55 volts, or advancing to 2, .2 of 55 volts, equal to 11 volts. And on advancing the centesimal slide, there will be added at each successive coil contact .01, .02, .03 or .04 of the initial 55 volts, or

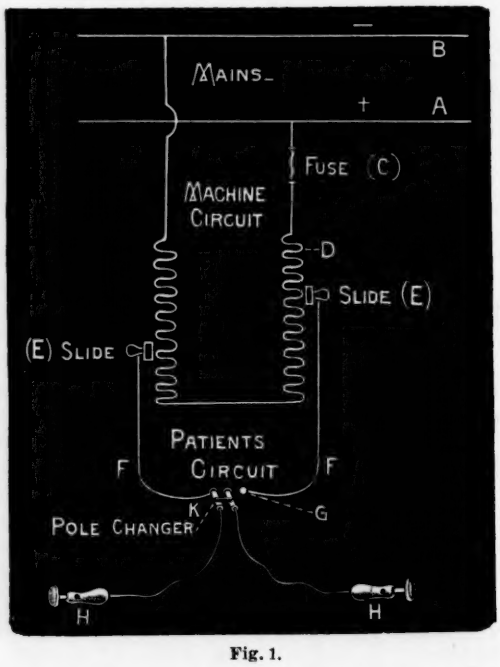


Fig. 1.

if stopping at 4, equal to 2 volts, which added to the 11 volts of the decimal slide, makes in all 13 volts. This is the arrangement of the mechanism with which I have treated most of my cases.

In one case herewith reported, I placed two 16 candle lamps, in series, in the circuit, which reduced the initial electro-motor force with which the controller had to start, to 27 volts, and with the advance of the decimal slide to 1, 2 and 3, each point represented .1 of 27 volts, and each successive contact of the centesimal slide an addition of .01 of 27 volts. In this manner a finer subdivision of the voltage is made and, possibly, less shock occasioned as the contact is moved from coil to coil.

The lamp must be placed "in series" and not "in multiple," Figs. 2 and 3. The degree of reduction in the E. M. F., when thus placed, was accurately determined by means of a volt meter.

The controller has been constructed and has been thoroughly tested with a view to absolute safety. A fusible wire that burns out when the current exceeds 500 m.a. is placed in the machine circuit; the supports for this fuse being two inches apart, it is impossible for the largest commercial currents to "arc" across, or jump from post to post. In addition, connected with the Edison circuit to which I attach the controller are two fusible plugs, one in the house and one on the street, which serve to protect the Edison mechanism against the results of accidental connection, when grounded, of their own and other more highly charged wires, *e. g.*, arc lighting and trolley wires. Moreover, the one or two 110 volt lamps which are placed in the circuit to reduce the initial voltage would serve as additional safety appliances against the largest commercial currents, for they would be burned out, and being arranged in series, the circuit would then be interrupted. Any or all of these, it would seem, would prevent anything like a fatal charge ever accidentally reaching the patient, but the main reliance against what might prove a painful shock is placed on the controller fuse itself, which I am assured is of delicate and accurate construction. Mr. Neiswanger, of the McIntosh Battery & Optical Co., states that he made the following tests before an assembly of physicians and electricians at Rochester:

1. One thousand seven hundred volt alternating current, three fuses preceded the controller, of which the first two burned out on making the contact.

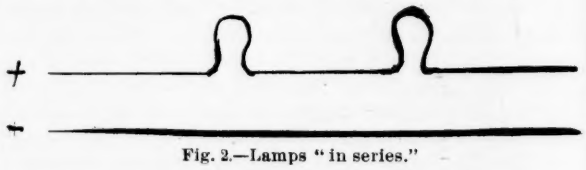


Fig. 2.—Lamps "in series."

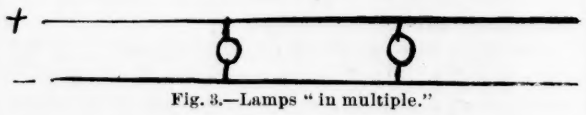


Fig. 3.—Lamps "in multiple."

2. One thousand seven hundred volt current, one fuse preceded the controller; both it and the controller fuse burned out.

3. One thousand seven hundred volt current connected directly with the controller; both sponge electrodes held in one hand, fuse burned out instantly without communicating any charge to the experimenter.

The character and arrangement of the needles still presents a fruitful field for the labors of those especially possessed of mechanical abilities. Two methods are in vogue, the monopolar and the bipolar, although the latter is now preferred by Moure and his followers. By the monopolar method, a single needle attached to one pole, preferably the positive according to Moure, and the negative according to Garel, is inserted into the spur, while a large plate electrode of chamois, constituting the negative pole, is held on some indifferent portion of the body, as between the shoulder blades or on the upper arm.

By the bipolar method, two needles, one representing the positive and the other the negative pole, are both inserted into the spur, so that the current passes only from one needle to the other within the tissue to be destroyed, although the spur for a short space on all sides of the immediate area of insertion will be affected by the electrolytic action. The needles which I have used in the cases herewith reported are made of irido-platinum and are soldered to light

parallel copper bars, fashioned like a galvano-cautery electrode, for insertion into a cautery handle. I have not, however, used a handle, but fastened the instrument directly to the conducting cords for the sake of lightness and easier adjustment. The needle tips are 8 m.m. in length, 2 m.m. apart, and are quite thin. They are in fact rather delicate and too short for the larger spurs, so I have had constructed a heavier and longer pair made of irido-platinum, mounted in a similar manner and attached straight, to a delicate handle. These needles are nearly as stiff and hard as steel and have almost, perhaps not quite, an equal penetrating power. They are about 20 m.m. in length. (Fig. 4.)

The needles, instead of being permanently fixed parallel with each other, might be attached to separate holders and then introduced, each at any desired point in the spur, but this arrangement is awkward. At times it might be desirable to have one or both needles slightly curved, in order to more closely follow the contour of a curved excrescence. If parallel needles are used, they may be inserted either perpendicularly or horizontally, or at any angle between these positions, whichever conforms best to the shape of the spur.

Moure employs ordinary sewing or sailmaker's needles of steel, regarding the oxidation of the positive needle, when of steel, as immaterial if a new one be used at each treatment. Not being able to secure a satisfactory adjustable needle holder which would carry two points, I have used needles of platinum, hardened by admixture with iridium, which not being oxidizable, can be permanently soldered to a delicate holder and are then always ready for immediate use.

Fig. 4.—Author's Needles.

It is the consensus of opinion that the bipolar method is equally efficient and less painful and troublesome than the monopolar, and also that with the bipolar method not more than two needle tips, one representing each pole, should be used.

Case 1.—Mr. W. M., medical student, is under treatment for hypertrophic rhinitis, and has also an excrescence from the base of the cartilaginous part of the septum, not of large size but which materially diminishes the lumen of the nostril.

Feb. 22, 1895, electrolysis by means of the Edison current and McIntosh current controller, one 16 candle lamp in the circuit. Bipolar method with irido-platinum needles 8 mm. (⅓ in.) in length, attached in a single holder 2 mm. apart. The decimal slide of the current controller was pushed to 1, and the needles were then inserted into the anterior segment of the spur. The slide was then advanced to 2, which equals a current of 11 volts, the milliampère meter registering 15 milliampères; ebullition of gas; crackling sounds; not painful. The current was then increased by pushing the centesimal slide gradually to 4=13 volts, registering 17 milliampères. Now painful but tolerable. Continued seven minutes. The needles were then withdrawn and re-inserted one-half inch farther back in the posterior segment of the spur and the process exactly repeated for seven minutes. One drop of blood only on withdrawing the needles the first time.

March 1. He reported having suffered no discomfort from the treatment.

March 14. The slough has not yet separated.

March 26. Result very satisfactory, the spur having disappeared, all except an insignificant remnant close to the nasal floor.

Remarks.—This was an experimental case. The excrescence was of small dimensions and chiefly cartilaginous. I might not have deemed it necessary to interfere with it by the surgical method, yet the patient is much improved by its reduction. The slough did not separate, as a whole, but seemed to liquefy, and be in part discharged and in part absorbed without complete destruction of the mucous membrane, which has therefore been reproduced in the process of cicatrization more perfectly than is usual after the cutting operation. This is an advantage as the tendency to incrustation, so frequently observed after the surgical method, due to the poor quality of reproduced mucosa will be avoided. It is an advantage, however, which does not invariably follow electrolysis, since if the slough produced be large it will separate as a whole, with corresponding complete destruction of the surface mucosa.

Case 2.—Mr. A. G. M., has been under treatment for hypertrophic rhinitis and adenoid vegetations which are now remedied. He still complains of inability to breathe through the right side of his nose which disturbs his sleep. The cartilaginous septum is deflected to the right and, in addition, situated toward the base of the convexity is an excrescence which projects sufficiently forward to approach the partially collapsed ala and so close the nostril. By the removal of the excrescence without interference with the deflection, enough space could be gained for comfortable respiration. The patient is of a nervous disposition and slight operative measures cause him involuntarily to flinch so badly that the surgical method might involve unusual difficulties.

February 23. Electrolysis by means of the Edison current and McIntosh current controller, one 16-candle lamp in the circuit. The same needles were used as in Case 1, being inserted 8 mm. into the anterior segment of the spur for eight minutes, then withdrawn and re-inserted the same distance behind, into the next adjoining segment of the spur for six minutes. With each insertion the decimal slide was advanced to 2, and the centesimal slide to 3, which equals about 13 volts, the milliampère meter registering at different moments from 15 to 25 milliampères. Pain was felt only on making the contacts, chiefly on increasing the decimal slide from 1 to 2. A whitish discoloration, shading off to blue, was observed around the needles, and thus guided, an inspection of the opposite side was maintained in order to guard against ultimate perforation.

March 11. The slough from the previous treatment has separated leaving a large concavity with projecting edges back and front of it which must be removed. Electrolysis to the anterior edge, care being taken not to perforate because the needles, superficially inserted, are nearly opposite the point of greatest concavity. Therefore a current of much less intensity, E.M.F., 7.5 volts, 7 milliampères was applied for seven minutes. Result satisfactory.

March 29. Electrolysis to the posterior edge or segment, the same quantity of electricity as at the first sitting being used.

April 9. Final result entirely satisfactory, the excrescence having been removed quite as perfectly as if it had been done by the surgical method.

Remarks.—The treatment was unusually tedious in this case, three sittings being required, because unusual care was necessary not to produce a perforation by too extensive an effect at any one time. It has been asserted as a disadvantage, that perforation is especially liable to result from electrolysis. This case satisfied me that it could be avoided by proper care in any case in which it would be avoidable by the surgical method.

Case 3, for the sake of brevity will not be recorded in detail Mr. M. J. H., age 25, suffered from pulmonary tuberculosis in a state of arrest, but he complained at this time of nasal obstruction due to an excrescence, of the kind which begins anteriorly and runs upward and backward, following the sutural line of the vomer and cartilaginous plate of the sep-

tum and terminating opposite the middle turbinal. Both cartilage and bone entered into its composition and the result of electrolytic treatment was fairly satisfactory, the spur being very much reduced in prominence but not wholly removed. The reduction in volume of the spur was probably commensurate with the proportion of cartilage contained in it.

Case 4 was less successful. Mr. E. R., aged about 19 years, has been under treatment for hypertrophic rhinitis, adenoid vegetations and hypertrophy of the tonsils, which are now remedied. He has also a septal spur of the kind which begins anteriorly and runs upward and backward, terminating opposite, and projecting into, the middle meatus of the right side. Likewise a smaller chiefly cartilaginous excrescence on the left side, anteriorly at the base of the septum.

March 20. Electrolysis to the spur of the right side; 11 volts, 20 milliampères for four minutes, when the patient so nearly fainted that it was necessary to discontinue the treatment. The needles would not penetrate thoroughly into the spur, the bone seemingly being of ivory hardness.

March 22. Electrolysis to the smaller cartilaginous excrescence on the left side; 11 volts, 12 milliampères for five minutes; the patient again complaining of faintness and pain the treatment was abbreviated.

April 22. The larger spur is practically unchanged; the smaller cartilaginous one has disappeared but the space has not yet entirely healed.

April 27. Electrolysis again attempted on the larger spur, the heavier needles for greater penetrating power, and the method with two lamps in the circuit for the more gradual application of the current being selected. This treatment was also a failure for the needles could not be made to penetrate adequately, and beside the patient nearly fainted after three minutes of a current of only 8 volts and 10 milliampères.

Remarks.—This case demonstrates that the electrolytic method has its limitations. As one would expect, difficulty will be encountered in inserting the needles into those spurs and ledges which are composed largely of bone of ivory-like hardness, which would seem to limit the method in its greatest degree of usefulness to excrescences which are composed mainly of cartilage, or to those of bone in which it will suffice to remove the cartilaginous surface, together with whatever of adjoining bone can be influenced without inserting the needles directly through hard bone itself. However, the cases of spur from the nasal septum for which the electrolytic method of reduction *is* applicable are very many and with the efficiency, convenience and compactness of the McIntosh current controller which adapts the Edison electric circuit to its use, I consider it a valuable addition to our resources. Still other cases are under treatment, the result of which additional experience will be communicated at an early date in another paper.

Venetian Building.

TREATMENT OF PELVIC PUS CASES BY ABDOMINAL SECTION—REPORT OF SIXTY-SIX CASES, WITH REMARKS.

BY J. WESLEY BOVÈE, M.D.

WASHINGTON, D. C.

In this resumé of my work in abdominal section for the relief of various suppurating diseases in the female pelvis, whatever I may offer as deductions is given for what it is worth. Previous to 1891 this class of surgery was little known in this city and, I might almost say, not at all practiced. So that four years practically covers the amount of time over which ranges the experience of Washington abdominal surgeons in celiotomy in cases of pelvic pus.

A large majority of the series have been operated upon in the presence of quite a large number of medical students and physicians, and have been in the free wards of Columbia and Providence Hospitals. From the nature of the environments of such patients, their general condition is usually very bad. Add to this, the effects of such devitalizing pathologic conditions, as are noted in another part of this report, and you will easily understand how feeble is the framework upon which we hope to effect a regeneration. I am very certain that a number of patients who were saved by operation, would have soon died had non-surgical treatment alone been employed. I am more positive of this, because of certain other cases that were admitted to the hospitals and died before operation. In this belief I know that I am antagonizing the statement of the lamented Goodell, "that very rarely will these pus cases die if not operated upon." During my service at Columbia Hospital for Women, have been admitted cases I have considered too weak for operation the day of admission; I have directed the resident physician to prepare them next day for operation, provided they were living, and they have died in the meantime. Other cases have refused to submit to operation and have died within a short time outside.

These cases have led me to appreciate how near the life-margin were a number of those in this report before operation. You will, therefore, readily understand that a series of such cases does not indicate a series of selected cases operated upon for a fine record rather than saving of endangered lives. Had I been jealous of my record, I could easily have declined operation in some cases that died afterward. In fact, seven of my mortality list were cases that were considered far more liable to die than to recover.

My first case of this kind was done March 17, 1891. It was a puerperal case, delivered in Columbia Hospital. Puerperal septicemia followed and a large abscess in the abdomen was detected. High fever and a rapid feeble pulse with other dangerous symptoms being present, abdominal section was done the forty-second day after labor. By the hospital people it was thought she would die with or without an operation, and I afterward learned the hospital superintendent engaged a special nurse for two days, expecting the patient to live no longer than that. The uterine wall had been bored through on the left side just above the ovarian ligament, the cavity of the Fallopian tube had become a part of the abscess cavity, which extended nearly to the spleen and was separated from the intestines by a great mass of exudate. The abscess sac was removed and the uterine wound cleaned and sutured. She made an excellent recovery and is now robust and well. This was, I believe, the first case of the kind successfully operated on in this city. Twice since, have I operated (Cases 3 and 29) in cases of puerperal septicemia in which putrid infection was present, both patients dying. I believe this variety of cases is the worst the abdominal surgeon has to deal with. As it is considered a fatal condition, the saving of even a small percentage of cases of puerperal putrid infection by celiotomy should be considered quite successful. When you open a women's abdomen and find the broad ligament, lymphatics, intestines and other adjacent structures saturated with pus, as was one of my cases, you can not but realize how little we can do to prevent a fatal termination. But we must hope to find most puerperal septic cases in a

more favorable condition. In the very bad cases I am not sure that abdominal surgery is advisable. I am convinced cases like No. 3 should not be subjected to operation. In this case, the ovaries were large free pus sacs, the Fallopian tubes apparently normal, and the lymphatics between the ovaries and uterus, great pus channels. The autopsy revealed the uterus, kidneys and intestines riddled with pus. Case 29 lived two weeks and died twenty-four hours after a hurried second operation which revealed the posterior wall of the uterus entirely sloughed away and the intestinal wall reservoirs of pus. This pus is highly infectious and the patient rapidly succumbs to the poison.

I have done no simple exploratory operation in pus cases and have never abandoned a case. As a result, the number of deaths from operation is greater than it otherwise would be. The question of leaving an appendage in suitable cases has been presented to me in a practical manner but a few times, double disease being present in nearly every case. I have when possible, left an ovary, or a portion of one, that the menopause might not be brought upon the patient suddenly while she is recuperating from the depression of vitality due to disease and suppuration. The patient does not feel unsexed if menstruation continues.

The right appendage, has in a large majority of my cases, been the most severely diseased, and very often I found the vermiform appendage so intimately adhered to a right suppurating mass as to require its removal. In a few cases it was slightly adhered to the uterus or Fallopian tube and not removed.

Pyosalpinx on both sides occurred in thirty cases, and on one side only, in seventeen cases, making forty-seven cases, or 71 per cent. of the series in which pyosalpinx, technically speaking, was present. Pus was present in the tube, however, in sixty-five cases. Double tubo-ovarian abscess was found nine times and in twelve cases this condition was on one side only—much more frequently than I had supposed it is found.

Ovarian abscess was found in fifteen cases, being double four times.

Deaths.—The mortality rate of all cases was 16 per cent. Case 2 was a very bad one and would, perhaps, have died had the most skilled abdominal surgeon done the operation. Owing to lack of experience my conception of the pelvic conditions may have been exaggerated and possibly I would now successfully operate in similar condition. She survived the operation but five hours, dying from shock.

Cases 3 and 29 have been previously mentioned as suffering from putrid infection. Case 10, tubo-ovarian abscess and broad ligament cyst of the opposite side has already been referred to. She took ether badly; the pulse was 150 as the operation was about to begin. It was considered a temporary effect of ether and the operation proceeded. Strychnia and brandy were generously given hypodermically during the fifty minutes the operation consumed. The cyst was principally on the right side, though it had lifted up the peritoneal coat of the uterus entirely and dipped down into the left broad ligament and Douglas pouch. It contained three quarts of clear fluid and was not entirely removed. A left tubo-ovarian abscess, badly adhered, was removed. Her pulse was 180 at the finish and the patient continued in shock until her death, thirty-three hours later.

Case 12, hydrosalpinx and pyosalpinx. The adhesions in this case were such as are seldom found. When anesthetized the appearance of the abdomen reminded one of a uterine fibroid reaching nearly to the umbilicus. This proved to be a hydrosalpinx, formidably adhered and very large. Its enucleation was an exceedingly difficult task and led to severe bowel tears. A Fallopian tube containing six ounces of pus was removed from the opposite side. I erred in stopping to suture the intestinal wounds, as the operation was thus prolonged to ninety minutes and the patient did not react from the shock before her death seventeen hours later.

Number 14, had had a criminal abortion performed and the removal of double tubo-ovarian abscess was followed by panic. The patient clamored to go home and declared she would die if kept in the hospital. Despite these features of the case I expected her to recover. She suddenly expired, however, on the third day after an effort to get out of bed. She probably died from embolism.

Case 21 was one of double pyosalpinx and a right ovarian abscess containing four ounces of foul-smelling pus; a bad case with general adhesions. The operation required thirty minutes and a drainage tube was used three days. Until the ninth day she progressed as favorably as any patient could be expected. During that day she had a severe pain in the region from which the ovarian abscess was removed. Suspecting bowel adhesions to be the cause, salines and other remedies were administered, but the bowels did not respond satisfactorily; the abdomen was meteoric; the intensity of the pain continually increased and her expression was anxious. On the fifteenth day vomiting, not stercoraceous, set in and that afternoon I reopened the abdomen and found three loops of small intestines fastened by general adhesions into the right half of the pelvic cavity. The amount of adhesions that had formed in fifteen days in spite of salines and other drainage was remarkable. The intestines were liberated and punctured to allow escape of gases. She was flushed out with normal salt solution and a hot rectal enema of salt. Epson salt and whisky administered. She lived about thirty minutes. When vomiting began, I realized I had postponed the second operation too long, but tried to make amends by operating even at that late stage.

Case 35 was an emergency case, a prostitute and opium habituè, suffering with intestinal obstruction, almost constant stercoraceous vomiting and an abdomen filled with pus. The next morning after entering Providence Hospital I saw her and urged abdominal section which she absolutely refused. She decided to go to Baltimore next day, a trip I knew she could not possibly take, and she was given morphia in large doses. That night a telephone message from the hospital announced her desire for operation. The following morning her condition was such that an operation seemed cruel. Nevertheless I opened the abdomen under ether. As soon as the peritoneum was incised about six ounces of pus escaped. The intestines and omentum were separated from the inferior surface of an ovarian abscess extending nearly to the liver. From the character of adhesions, I suspected a dermoid cyst. It was aspirated, but as this process seemed too slow, a Tait's trocar was used to empty it of about three quarts of horribly offensive pus. A ruptured pyosalpinx was found and removed and another containing four ounces of pus was re-

moved from the other side. Nearly a gallon of pus was removed from this patient. The operation was hurried, but the patient died a few minutes after its completion. During the operation she seemed likely to die at any minute and I did not expect her to be taken from the table alive. I have since learned she had had an abortion about four weeks before the operation.

Causes.—I do not think that social condition and age have much bearing upon the etiology of these conditions, except that puberty and the menopause usually limit the time. Then, too, so long as otherwise respectable women resort to criminal abortion to rid themselves of prospective trouble incident to child-bearing and child-caring, they, as well as the various species of prostitutes, will be liable to pelvic suppurative inflammations. The relative number of cases due to gonorrhea is thus far speculative. A diagnosis by staining or cultures can hardly be expected in gonorrheal pyosalpinx or ovarian abscess of long standing.

Abortion is a frequent cause, as are various kinds of debauchery. In fact, I believe many cases might be traced to these, could a correct history be procured. I believe, however, that many cases of suppurative inflammation of women's tubes and ovaries are not due to sexual contact in any way, but rather to injuries from accidents, "taking cold" during a menstrual epoch or unusual hard work and exposure. Add to these a debilitated condition and we have the true causes of many cases. While gonorrhea lurks, for long periods of time, in the uterine mucosa, we often have endometritis in the virgin and it may easily extend to the Fallopian tubes, causing under favoring circumstances a purulent inflammation.

Anesthetics.—To produce anesthesia, ether alone was used in fifty-two cases; chloroform alone in two, and chloroform followed by ether, or *vice versa* twelve times. Where no contra-indications to either anesthetic exist, I prefer to begin with chloroform and if operation extends beyond thirty minutes, to substitute ether at the expiration of that time. For prolonged anesthesia I prefer ether. I am led to believe that the danger of producing renal hyperemia by anesthetics extends to the employment of chloroform. Case 64 was one in point.

Rupture of pus sacs during removal is a dangerous complication of celiotomy and should be studiously avoided. In weak patients the fight against disease germs by the peritoneum will be made easier for our patients, by preventing the leakage among the pelvic and abdominal viscera, that often follows such ruptures. We should be constantly on our guard to do so. Unfortunately we can not often prevent such rupture from taking place. We can, however, usually wall these pus collections off from the surrounding structures by gauze plaques; thus preventing contamination. Of course, there are many cases of sterile pus, but how are we to be sure of such conditions previous to the attempt at removal. In thirty-four of my cases, rupture occurred.

Adhesions were present in sixty-four cases and were very bad in forty-nine. Great care is necessary in dealing with them. The posture of Trendelenburg is undoubtedly of great assistance in separating bowel adhesions, as well as in checking hemorrhage from vessels of considerable size. In employing this auxiliary we should bear in mind that the abdominal viscera is placed nearly under the diseased pelvic structures, and leakage of pus among the intestines is thus facilitated. Nor should we lose sight of the fact that quite large vessels may be left open during enucleation in this position, only slight bleeding occurring, and when the horizontal position is resumed severe hemorrhage follows. It is probably best not to use this position beyond fifteen minutes. Great care is necessary to prevent injuries to the bowels in separating them from the masses to be removed. This occurred in nineteen of my cases, in five of which the bowel wall was torn completely through, the wounds stitched and complete recovery followed. Many times the recovery of the patient is greatly imperiled by the delay incident to suturing a number of small tears in the outer coats of the bowels and in such cases it is often best not to prolong the operation to cover these surfaces.

Hemorrhage from various causes often occurs during these operations. In a few of my cases it was due to the slipping off of ligatures from large or too short pedicles. In such cases it has been my practice to pick up the stumps of the ovarian and uterine arteries with artery forceps, whip-stitch the cut surfaces of broad ligaments between them and then to ligate these vessels separately and stitch them together. In patients of low vitality the loss of even a small amount of blood may endanger their lives. In such cases the hypodermic injection of normal salt solution has been resorted to with great satisfaction. In Case 33, severe hemorrhage occurred in a vein low in the broad ligament. One pint of this solution was thrown into the bowel and the abdomen flushed with it. During the following twenty-four hours she received, under the skin, a total amount of sixty-two ounces and made a good recovery. Case 57 was given six and one-half pints. We should avoid using too much at one time and placing too much in one place. I have had small sloughs form from these causes. When practicable, it should be injected into some medium-sized vein.

The use of sterilized hot water or salt solution in flushing out the pelvic cavity was followed in sixty cases. This is almost indispensable where pus has escaped during the operation or there is considerable oozing from adhesion wounds. The stimulating effect of flushing was not found so valuable as had been supposed.

Drainage.—I am very partial to the use of the glass drainage tube. It was employed in forty-one cases on an average of two days. I believe the time-honored maxim: "When in doubt, drain," is a safe one to follow, notwithstanding many abdominal surgeons consider its use as evidence of slovenly surgery. Unless the nurse be well trained, however, the danger accompanying its use counterbalances its advantages. I did not use vaginal drainage in any case, as I consider it inferior to abdominal. It is almost impossible to keep the vagina sterile. We are only to remember the odor and discharge that comes from the wound in the top of the vagina a few days after vaginal hysterectomy, to appreciate the liability to infect the pelvic and abdominal cavities if an opening from the vagina into the peritoneal cavity be left for drainage. The newly-made track through the abdominal wall, it seems to me, should be much better.

High temperature previous to operations was common. In some cases it was high at the time of the operation. In four cases that recovered, the temper-

ature ranged from 103 to 106 degrees for several days previous to operation, and in three that died, it ranged equally as high.

In such cases it was noticed that after the operation the temperature usually dropped rapidly the first day and, later, gradually to normal or thereabout. A transient, slight rise often occurs after operation, even in cases that have been normal in that respect. It is usually unimportant, being due to cathartics, stitch-hole abscesses or nervous irritation. There must be something more than moderate fever to indicate danger.

Additional Operations and Complications.—In eight cases, endometritis was such a marked complication that curettement and packing of the uterus was done just before the abdomen was opened. In Cases 21 and 29, both fatal, a second celiotomy was done.

Intestinal obstruction was present in Case 21 after the first operation and in Case 35, making a primary operation imperative. Abdominal fistulæ followed in three cases for various periods. I may perhaps attribute to Dame Fortune the fact that, so far as I know, I have had in these sixty-six cases no pelvic hematocele or mass of exudate (other than three abdominal fistulæ cases); no fecal fistulæ, no ureteral injuries and no tear completely through the bladder wall. Two cases of peritonitis occurred, Nos. 21 (incident to intestinal obstruction) and 53.

After-Treatment.—The patients are usually kept in bed twenty-one days and if any complications be present at the expiration of that time, their getting up is postponed. Often, if the patient is restless the first night after operation, one-twentieth to one-tenth of a grain of morphia is administered hypodermically, which relieves sufficiently pain and relaxes nerve tension to produce a night's sleep with the result of having a refreshed patient next morning. This is a great gain in desperate cases where we look to the first two days' history as an indication of the ultimate result. It is not sufficient to cause bowel paralysis. The second day an attempt is made to move the bowels by salines and purgative enemata. When this has been effected once or twice and the patient is little disturbed, our prognosis should be favorable, The use of strychnia both before and after operation, by the mouth and hypodermically, is of great value. It is the best heart tonic and hypodermically is an excellent stimulant.

The examination of urine is of the utmost importance before any severe surgical operation can be performed. We can not be too particular about its condition. It is not sufficient to have the specific gravity, reaction, and absence or presence of albumin in a given specimen. We should know the amount voided in a full day, and in addition, too, the amount of urea and urates, also whether epithelium from kidneys or ureters is present. We must ascertain whether the kidneys are acting well as eliminators, whether the *débris* of tissue waste is being carried off. We must not be misled by a trace of albumin as the only pathologic ingredient, for it often comes from the vagina instead of the bladder. Catheterized specimens are most reliable for examination. A trace of albumin often occurs when large collections of pus are present.

SIXTY-SIX CASES IN WHICH CELIOTOMY WAS DONE FOR PELVIC, PUS-FORMING DISEASES.

Case 1, I. M., age 22, single; puerperal septicemia, tubo-utero abdominal abscess, removal of left appendage and cornu of uterus March 17, 1891, glass drainage three days; recovered, operation forty-two days after delivery.

Case 2, L. F., age 30, single; putrid infection, multiple abscesses, removal of both appendages Feb. 15, 1892, glass drainage; died in sixty-three hours.

Case 3, Mrs. —., age 30, married; double pyosalpinx and double ovarian abscesses, removal of both appendages in pieces April 26, 1892, glass drainage; died in five hours.

Case 4, Mrs. N., age 30, married; double pyosalpinx, removal of both appendages June 2, 1892, no drainage; recovered.

Case 5, Mrs. M., age 40, married; double tubo-ovarian abscesses, removal of both appendages Sept. 14, 1892, glass drainage two days; recovered.

Case 6, L. W., age 23, married; donble tubo-ovarian abscesses, removal of both appendages April 22, 1893, glass drainage two days; recovered.

Case 7, M. W., age 27, widow; double tubo-ovarian abscesses, removal of both appendages May 18, 1893, glass drainage three days; recovered.

Case 8, E. D., age 27, married; double pyosalpinx and large pelvic hematocele, removal of both appendages and hematocele June 12, 1893, glass drainage two days; recovered.

Case 9, S. C., age 34, single; double pyosalpinx, removal of both appendages June 19, 1893, no drainage; recovered.

Case 10, A. R., age 42, married; right broad ligament cyst and left tubo-ovarian abscess, removal of both appendages and nearly all of cyst June 22, 1893, glass drainage one day; died in thirty-three hours of shock.

Case 11, Mrs. M., age 32, married; double tubo-ovarian abscess, removal of both appendages July 3, 1893, glass drainage two days; recovered.

Case 12, A. G., age 22, single; hydrosalpinx and pyosalpinx, removal o both appendages July 13, 1893, glass drainage; died of shock in seven teen hours, a very bad case.

Case 13, J. L., age 31, widow; left tubo-ovarian abscess and right pyosalpinx, removal of diseased parts July 27, 1893, glass drainage one day; recovered.

Case 14, A. C., age 25, married; double tubo-ovarian abscess, removal of both appendages August 29, 1893, glass drainage two days; was panic-stricken and died suddenly on third day.

Case 15, Mrs. M., age 23, married; double pyosalpinx, removal of both appendages August 30, 1893, no drainage, recovered.

Case 16, L. D., age 18, married; left suppurating dermoid cyst of ovary and right tubo-ovarian abscess, removal of both appendages Sept. 7, 1893, no drainage; recovered.

Case 17, M. M., age 26, widow; left tubo-ovarian abscess and right ovarian abscesses and pyosalpinx, removal of both appendages Sept. 14, 1893, gauze drainage a few days; recovered.

Case 18, S. H., age 23, married; pyosalpinx and ovarian abscess, removal of both appendages Sept. 25, 1893, no drainage; recovered.

Case 19, M. W., age 18, married; double tubo-ovarian abscess, removal of both appendages Nov. 9, 1893, glass drainage one day, gauze two days; recovered.

Case 20, K. W., age 27, married; ovarian cyst and pyosalpinx, removal of both appendages Nov. 13, 1893, no drainage; recovered.

Case 21, L. G., age 23, single; ovarian abscess and double pyosalpinx, removal of both appendages Nov. 16, 1893, glass drainage one day, gauze two days; died on fifteenth day after second operation.

Case 22, L. J., age 27, married; left pyosalpinx and right utero-tubo-ovarian abscess, removal of both appendages Nov. 20, 1893, glass drainage two days and gauze; recovered.

Case 23, C. J., age 30, married; ovarian abscess and double pyosalpinx, removal of both appendages Nov. 23, 1893, glass drainage two days; recovered.

Case 24, L. B., age 21, widow; double tubo-ovarian abscess, removal of both appendages Dec. 11, 1893, glass drainage one day; recovered.

Case 25, S. S., age 22, single; double pyosalpinx, removal of both appendages Dec. 28, 1893, no drainage; recovered.

Case 26, E. S., age 18, married; double pyosalpinx, removal of both appendages Jan. 8, 1894, no drainage; recovered.

Case 27, N. S., age 24, married; double pyosalpinx, removal of both appendages, Jan. 8, 1893, glass drainage one day, gauze two days; recovered.

Case 28, C. A., age 30, married; pyosalpinx and tubo-ovarian abscess, removal of both appendages Jan. 18, 1894, glass drainage one day, gauze two days; recovered.

Case 29, Mrs. G., age 35, married; putrid infection, removal of both appendages Jan. 28, 1894, glass drainage two days; died in fourteen days after second operation

Case 30, Mrs H., age 25, widow; double tubo-ovarian abscess, removal of both appendages, Jan. 29, 1894, no drainage; recovered.

Case 31, L. L., age 22, married; double pyosalpinx and left ovarian abscess, removal of both appendages Feb. 5, 1894, no drainage; recovered.

Case 32, Miss K., age 26, single; ovarian abscess and double pyosalpinx. removal of both appendages Feb. 5, 1894, no drainage; recovered.

Case 33, L. A., age 22, single; large ovarian hematoma and double pyosalpinx, removal of both appendages March 8, 1894, no drainage; recovered.

Case 34, Miss M., age 19, single; double pyosalpinx, removal of both appendages March 20, 1894, no drainage; recovered.

Case 35, Mrs. S., age 32, married; double pyosalpinx and ovarian abscess and intestinal obstruction, removal of both appendages April 2, 1894, glass drainage; died in a few minutes; nearly one gallon of pus removed.

Case 36, Mrs. G., age 30, married; multilocular ovarian cyst and double pyosalpinx, removal of both appendages April 19, 1894, glass drainage two days; recovered.

Case 37, Mrs. D., age 38, married; dermoid ovarian cyst, ovarian cyst and double pyosalpinx, removal of both appendages April 26, 1894, no drainage; recovered.

Case 38, Mrs. M., age 39, married; ovarian cyst and pyosalpinx (pregnant), removal of both appendages May 17, 1894, no drainage; recovered; delivered Dec. 24, 1894.

Case 39, H. D., age 25, widow; double pyosalpinx, removal of both appendages May 21, 1894, glass drainage one day; recovered.

Case 40, Mrs. J., age 23, single; double pyosalpinx, removal of both appendages May 28, 1894, no drainage; recovered.

Case 41, Miss M., age 22, single; ovarian abscess and double pyosalpinx, removal of both appendages May 31, 1894, no drainage; recovered.

Case 42, Julia B., age 40, widow; right ovarian cyst and left pyosalpinx, removal of both appendages Aug. 27, 1894, no drainage; recovered.

Case 43, A. H., age 19, married; double pyosalpinx, removal of both appendages Sept. 12, 1894, no drainage; recovered.

Case 44, R. P., age 31, married; double pyosalpinx, removal of both appendages Oct. 17, 1894, no drainage; recovered.

Case 45, H. J., age 20, single; tubo-ovarian abscess and ovarian cyst, removal of both appendages Oct. 25, 1894, glass drainage two days; recovered.

Case 46, P., age 32, widow; omental dermoid cyst, double ovarian abscess and right pyosalpinx, removal of both appendages and dermoid Nov. 5, 1894, glass drainage two days; recovered.

Case 47, Mrs. C., age 20, widow; pyosalpinx a d tubo-ovarian abscess removal of both appendages Nov. 28, 1894, glass drainage two days; recovered.

Case 48, V. T., age 30, single; right pyosalpinx, removal of diseased part Dec. 20, 1894, glass drainage two days; recovered.

Case 49, E. F., age 19, single; ovarian abscess and double pyosalpinx, removal of both appendages Jan. 14, 1895, glass drainage two days; recovered.

Case 50, M. F., age 22, single; left parovarian cyst and right pyosalpinx, removal of both appendages Jan. 20, 1895, no drainage; recovered.

Case 51, Mrs. D., age 24, married; ovarian abscess and double pyosalpinx, Jan. 28, 1895, glass drainage two days; recovered; curetted May 20, 1895.

Case 52, Mrs. W., age 27, married; tubo-ovarian abscess and salpingitis, removal of both appendages Jan. 31, 1895, glass drainage three days; recovered.

Case 53, H., age 19, widow; double pyosalpinx, left ovarian abscess and endometritis, removal of both appendages and endometrium March 10, 1895, glass drainage; died, acute septic peritonitis.

Case 54, M. G., age 25, single; double pyosalpinx and double ovarian abscess, removal of both appendages March 10, 1895, no drainage; recovered.

Case 55, A. P., age 35, single; double pyosalpinx and double ovarian cysts and uterine fibroids, removal of both appendages March 14, 1895, no drainage; recovered.

Case 56, M. S., age 33, married; double tubo-ovarian abscess, removal of both appendages March 21, 1895, glass drainage thirty-two hours; recovered; left abscess contained twenty ounces of pus.

Case 57, H., age 25, married; pyosalpinx, ruptured tubal pregnancy and endometritis, removal of both appendages and endometrium March 23, 1895, glass drainage thirty-six hours; recovered; septic infection due to attempted criminal abortion.

Case 58, J. B., age 27, single; pyosalpinx and tubo-ovarian abscess, removal of both appendages April 7, 1894, glass drainage; recovered.

Case 59, J. W., age 38, married; pyosalpinx and pelvic abscess, removal of both appendages April 15, 1895, glass drainage; died of shock, nineteen hours later, mitral regurgitation.

Case 60, Mrs. S., age 23, married; double pyosalpinx, ovarian abscess, ovarian cyst and endometritis, removal of both appendages and endometrium May 1, 1895, glass drainage two days; recovered.

Case 61, I. S., age 23, single; pyosalpinx and tubo-ovarian abscess, removal of both appendages May 4, 1895, glass drainage thirty-six hours; recovered; septic; case emaciated.

Case 62, C. M., age 24, single; double pyosalpinx and ovarian cyst, removal of both appendages May 13, 1895, glass drainage two days; recovered.

Case 63, L. J., age 24, single; pyosalpinx and tubo-ovarian abscess, removal of both appendages May 22, 1895, glass drainage one day; recovered.

Case 64, M. B., age 24, married; double pyosalpinx, removal of both appendages May 30, 1895, glass drainage; died in twenty-two hours; autopsy showed one kidney useless and the other acutely congested, suppression of urine.

Case 65, L. M., age 18, single; double pyosalpinx and ovarian abscess, removal of both appendages June 6, 1895, glass drainage one day; recovered; bowel badly torn.

Case 66, L. D., age 21, single; double pyosalpinx, removal of both appendages June 17, 1895, no drainage; recovered.

IS THIS LEPROSY?

PRESENTATION OF TWO CASES.

Read before the Fiftieth Annual Meeting of the Ohio State Society at Columbus, Ohio, May 16, 1895.

BY J. C. McDOUGAL, M.D.
NEW LEXINGTON, OHIO.

I am glad that I am able to present these two very interesting cases for your examination; for the unusual circumstances under which they have developed render it important that a correct diagnosis be made, and to that end only do I direct my present inquiry and solicit your every aid.

Hannah M. Garey first came under my observation in December, 1894, when she was examined by the New Lexington Pension Board. Drs. P. A. Gordon and G. W. Clemson participated in the examination. She had applied for pension as a dependent child of Geo. W. Garey, a deceased soldier of the 187th Regiment Ohio Infantry, and at that time she presented the following manifestations of a disease we diagnosed as anesthetic leprosy: the left hand and lower forearm were swollen and rather firmly thickened, the hand and wrist being about twice the normal size. The distal phalanges were all lost, except from the little finger and thumb, and the stumps were all healed. The thumb nail was deformed and discolored. The hand was being amputated at the radio-carpal articulation by a narrow, encircling, ulcerative process, and the work was so near completion that only the ulnar vessels and some of the tendons remained. Both surfaces were covered by granulations, were bathed with extremely foul-smelling pus and were yet held in close apposition, except at the bordering skin, where some retraction had taken place in the healing process which had begun.

The right hand and fingers were somewhat swollen and clubbed and all the distal phalanges except those of the little finger and thumb were lost. The wrist joint was somewhat deformed because of an unnatural prominence of the head of the ulna on the dorsal side. Both feet were swollen and thickened and this condition also involved, to some extent, the legs, being more marked in the left. From the left foot the first and second toes were entirely lost, the third toe was off at the proximal phalangeal joint and the fifth toe all lost. On the plantar surface of stump of great toe was a thick dark crust covering an unhealed ulcer. In the middle of the left sole was an ulcer the size of a silver half dollar which reached deep into the foot, and from which there came a very offensive discharge. From the right foot the great toe was lost, the second and third were off at middle of proximal phalanx and the fourth was pointed upward so that it was considerably out of line with the others. The little toe was not affected, except that it was involved in the general thickening of the foot. All the affected members were more or less anesthetic, the thermal anesthesia being especially marked.

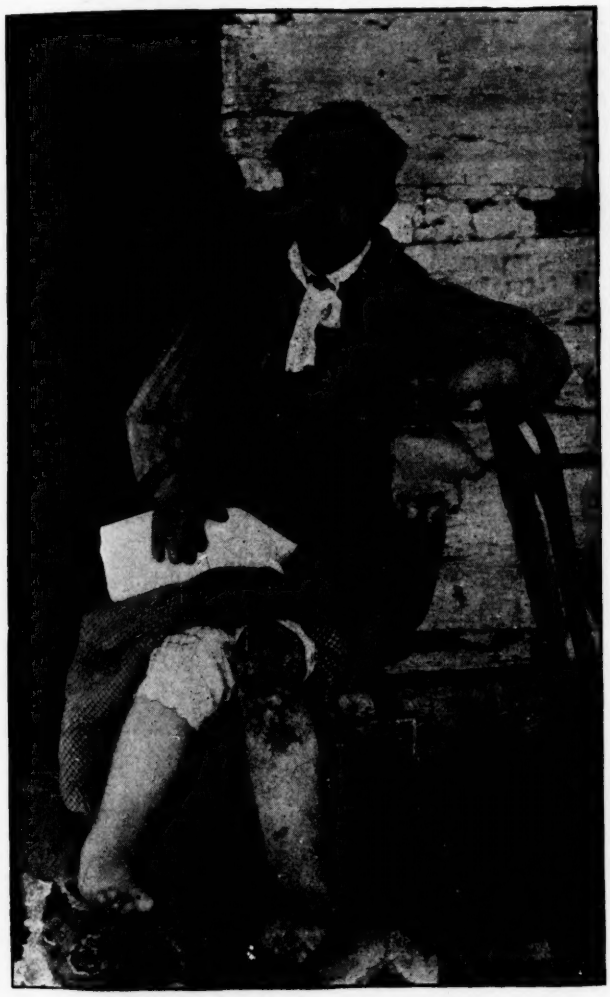
There was a blister, the size of a silver quarter, on the back of right arm just above the olecranon. The end of the tongue had been destroyed by ulcerations that had healed; the left side of lower lip and both wings of nose had suffered loss from the same cause and were consequently deformed, and the lower jaw had likewise suffered loss of bone, teeth and gum. Her eyes looked weak and blinking and her vision was poor.

She is 18 years of age and this malady began to manifest itself, so her mother states, by abscess formations in her legs when she was about fifteen months old. In two or three years the toes began to ulcerate and come off, and then the hands became involved. The flesh ulcerated from the fingers leaving the blackened dry bones exposed, and these she persistently drummed on the tables and chairs until her mother cut them off with shears. She menstruated moderately regularly from the time she was 14 years of age until one year ago, when menses ceased. The plantar ulcer had been a perforating one, so that when the mother used poultices—as she did—on the top of the foot they would run through, unless the foot rested on something to stop the plantar opening.

January 18 of this year, I saw her again in company with Dr. McTeague. At that time she was sweating freely, though the house was cold, and her pulse was accelerated. She complained of pain in neck and left leg from which she had been suffering much. Her mother said she had lately fallen several times, limp and motionless, and that she had been having some sort of choking spells. The hand was still further separated so that it hung downward when the arm was raised. On the back of the hand was an extensive gangrenous blister, due to the pressure of splints used to hold the hand in position. The epidermis covering the remainder of the hand had been recently shed, and replaced by the formation of new. The blister on elbow had healed, and the skin marking its location was papery and harsh and completely insentient to touch or pain. The

plantar ulcer was healing, and covered by a thick, black, offensive crust.

I next saw her February 15, 1895. At this time there was a large ulcer, with sharply defined edge, on the back of hand, corresponding in size and location to the blister seen on former visit. Since my previous visit there had appeared for the first time in the history of the case—so far as we were able to learn—an eruption on the left side of neck and on the front of left leg. The eruptive spots were not raised, were dark yellowish-brown in color on the leg and darker on the neck. They were thickly set and made with the surrounding skin a dappled appearance, which shows fairly well on the leg in the photograph. Since the appearance of the eruption there have been no choking or fainting spells. The plantar ulcer,



after a duration of about five years, was now healed. At this time the negatives were obtained from which the photographs were made, and the hand was removed and sent away for bacteriologic examination.

Her younger sister Hattie is 8 years of age, and has been afflicted for about three years. Her feet are clubbed and legs stocky. The great toe of left foot is off at middle of proximal phalanx. There is a dark crust on lower part of stump. The distal phalanx of second toe is lost. The right great toe is like the left. The nail is lost from second toe and the ulcer which was present on the top of toe—as you can see in the photographs is now healed. The little toe has been entirely destroyed and a healthy stump remains. There is some anesthesia of feet and legs. There was a moderately indurated swelling on outer front side of leg just above the ankle, which has almost disappeared.

The hands, you see, are also affected. They are thickened and chubby. The thumb nails show evidence of disease. The ends of index fingers are off and here an apology for nails is offered in the existence of small, dark, horny thickenings on the centers of ends of fingers. On the radial side of the wrist the skin is rough, and here are a number of small wart-like elevations. You will notice a number of blisters on the palmar surfaces of her hands. These are accounted for by the fact that she is fond of parching corn in a skillet on the cookstove and her touch can not appreciate a destructive degree of heat, and consequently her hands are frequently burned. You have seen that she is unable to appreciate any difference between the feeling of a bottle filled with hot, and another filled with cold water. Her eyes are red and tearful. Her voice is coarse and croaks, and she has a croupy cough at night.

Both girls have suffered at times from painful nerves, and when deep abscesses formed, or when amputations began in the bones they suffered from them. But the ulcerations, though reaching deep into the tissues or even destroying a member, have not been painful.

Hannah walked with little discomfort on the plantar ulcer, and during the later stages of the destructive process that robbed her of her hand she suffered none, and laughed when it was being cut away.

The mother insists that these ulcerations are always the result of some accidental injury. They sometimes heal kindly after a variable duration, and sometimes go on to complete destruction of the part.

These sisters have never been outside the State of Ohio. Both parents and all the grandparents were natives of Ohio and belonged to healthy long-lived families. The parents were married in 1866. There are eight children and all are healthy except Hannah the fourth born, and Hattie the last born. The mother is 44 years old, and healthy. The father was pensioned for sunstroke. He is reported as having died of some brain trouble March 10, 1893. He had an offensive discharge from the nose and an eruption on upper lip and end of nose. This trouble developed shortly after marriage and was never recovered from. Physicians, who had treated him for it, called it catarrh and eczema. The 187th Regiment Ohio Infantry, of which he was a member was stationed during the few months it was in service at Nashville, Tenn., and at Dalton, Kingston and Macon, Georgia.

This is about all of practical importance I know, concerning these unfortunates. Then let us see "where we are at," and whether or not the probabilities are that a mistake has been made in attributing lepra as the cause of all these manifestations.

The most comprehensive discussion on the subject of leprosy I have found, is given by Prince A. Morrow in his system of Genito-Urinary Diseases, Syphilology and Dermatology. It contains the apparent truth of all I have been able to read on this subject.

For the purpose of comparison, permit me to recite here the most prominent and distinguishing symptoms of the anesthetic form of leprosy as given by him: the phenomena are essentially those of mul-

tiple neuritis, consisting principally of disorders of sensation and nutrition. The first cutaneous manifestations of nerve leprosy are usually in the form of bullæ or erythematous spots. They may not appear, however, for years later, and they may even fail altogether. Analgesia and thermo-anesthesia may be present with or without impairment of the tactile sense. Most of the cutaneous lesions encountered in nerve leprosy, before the mutilating stage sets in, are due to the blunted sensibility. The deadened nerves give no warning through the perception of pain of the inroads of heat, cold, or other external source of injury. A patient often receives severe injury as a scald or burn, unconsciously, or a pin may be thrust into the flesh without causing pain. Sensibility to puncture, however, is variable, not only in different parts of the body but in contiguous spots; the same is true of sensitiveness to temperature. There are frequent phenomena of disassociation. Some have no perception of cold, but feel heat, and *vice versa*. There is also slowness in the transmission of sensation. Although the most frequent sites of the spots are the legs about the ankles, they may be found on the backs of the arms and shoulders, the elbows, the back, the abdomen, the nates and the face; they are rarely seen on the palms and soles, and never on the scalp. Another form of eruptive lesion is the pemphigoid. The blebs are always located more particularly on the hands and feet, on the posterior surface of the elbows and the anterior surface of the knees. Many years may pass and the patient with the exception of an occasional innocuous eruption or neuralgic pain, may have no disorder of sufficient importance to awaken his suspicions as to the exceeding gravity of the disease with which he is afflicted. Pemphigus blebs locate on the phalangeal articulations and ulcerate, uncovering the deeper tissues, whose consecutive disease leads to the elimination of the bone and to extensive mutilations.

One of the most characteristic lesions is the so-called plantar ulcer, which is especially liable to occur in patients who habitually go barefoot. The bones of the fingers and toes may be lost without ulceration by a process of osseous absorption affecting one phalanx after another, or the phalanges may become the seat of gangrene, which extends until a mark of demarkation is found and the member is spontaneously amputated. The reparative process is usually prompt and complete, the stump healing perfectly; when the loss of the phalanges is only partial, the stumps may stand out at every conceivable angle, and often in the most distorted positions.

Now, by the light of this symptomatology—the most prominent landmarks given on the subject, let us look at these cases. Even though they have not true leprosy they suffer some disease so nearly like it in all its apparel of symptoms as to afford me ample apology for choosing the inquiry I did as the subject of my paper. I certainly have never seen a single case of typhoid fever that corresponded more closely in its symptomatology to the classical description of that disease than do these cases to the descriptions I read of anesthetic leprosy.

It would seem superfluous in this connection to consider eruptive diseases of the erythematous type, and the various pigmentary affections of the skin which may simulate the earlier stages of leprosy, but in which mutilations, sensory disorders or marked nutritional changes do not occur; and so would it seem superfluous to exclude by differential diagnosis those ulcerative or mutilating diseases whose evolution is unattended by dysesthesia or other disturbances of sensation; nor yet would I feel justified in occupying time in excluding diseases of the nervous system attended with disturbances of sensation, but which are not accompanied by mutilations. Such diseases may furnish one or more symptoms analogous to one or more of the symptoms encountered in the evolution of leprosy, but it is far more difficult to find points of resemblance between them and the disease here manifested, than points of difference.

Reynaud's disease or symmetrical gangrene is, we think, excluded by the fact that anesthesia is limited to the ischemic or cyanotic spots about to become gangrenous, and the gangrene is usually limited to a small area of the pulps of the fingers, or fingers and toes; extensive mutilations do not occur, and a peculiar characteristic of Reynaud's disease is the symmetrical distribution of the local symptoms, whether situated upon the trunk or extremities.

Morvan's disease or syringomyelia (*identical*) may bear a most deceptive resemblance to nerve leprosy that has developed only in the upper extremities. But syringomyelia may be excluded in these cases by the single fact that it never affects the lower extremities.

I received a copy of the report of the bacteriologic examination of a portion of the amputated hand, which I will read:

Treasury Department, Office of the Supervising Surgeon-General, Marine-Hospital Service.

WASHINGTON, D. C., March 28, 1895.

To the Supervising Surgeon-General, U. S. Marine-Hospital Service.

Sir:—I have the honor to make the following report on a specimen from a supposed case of leprosy, submitted for examination by Dr. C. O. Probst, Secretary of the Ohio State Board of Health.

The specimen presented for examination is a portion of the left hand, including the little and ring fingers. The entire member is thickened to about twice its natural size.

On the dorsum of the hand is an extensive superficial ulcer with sharply defined and irregular margin. At the wrist, the ulceration has extended deeply through the tissues, amputating the hand at this point. A similar process seems to have affected the tip of the ring finger.

Sections were made and studied from several different places. Four were taken from the edge of the ulcer, two from its center, and one through the skin and thickened subcutaneous tissue, including the nerve going to the little finger.

All the sections disclosed a general hypertrophy of the parts and a large overgrowth of connective tissue. Some of the specimens from the edge of the ulcer showed the histology of the specific granulomata. A thickening of the blood vessel walls was noticed in the subcutaneous tissue.

All the sections were stained for lepra bacilli, with negative results. Those sections containing giant cells were also stained for tubercle bacilli. None were found.

The disease, therefore, in my opinion is neither leprosy nor tuberculosis, which, by exclusion, throws some weight upon the suspicion of syphilis. Very respectfully,

(Signed) M. J. ROSENAU, P. A. Surgeon, M.-H. S.

Respectfully forwarded to the Supervising Surgeon-General.

(Signed) J. J. KINYOUN, P. A. Surgeon, M.-H. S.

(Copy.)

As granulomata occur in the new tissue growths of leprosy and also in tuberculosis, as well as in syphilis, we do not understand the report to state the specific granulomata to be pathognomonic of syphilis.

Because no lepra or tubercle bacilli were found, he concludes the disease is neither leprosy or tuberculosis, and therefore must be syphilis.

Relative to this, I again quote Morrow (New York

Medical Journal, July 27, 1889) who says: "The bacillus is not found in the chronic sores or necrosed tissues and bones of the anesthetic leper. Numerous and repeated examinations of sections of an amputated finger showed no bacilli." The same author in his text-book published in 1894—only last year—states with his first sentence on the diagnosis of the anesthetic form of leprosy: "While the identification of the lepra bacillus in the tissues is rarely practicable in nerve leprosy, yet the invariable presence of, anesthesia in established cases constitutes a diagnostic element of almost pathognomonic value." And similar statements are made by other authors. Did not, therefore, our esteemed bacteriologist go beyond the pale of scientific knowledge in expressing this opinion; and into the realm of speculation in concluding it was therefore syphilis?

I think that we have in these cases such a history and combination of symptoms as have never been approached in any case of syphilis any of you have ever seen in practice, or have ever read in a report. It is true the father had a disease of the nose which, so far as the description we have of it goes, might have been syphilis, lupus, or some other disease. But as the first symptom of leprosy is so often an affection of the nose we think we are justified, in the light of these subsequent developments, in our impression that it was of leprous character; and that somebody, somewhere and at some time, probably in the sunny South during the war, communicated to him this leprous malady, and that he is the source from which came this wreckage. Admitting that syphilis might show itself by such unprecedented manifestations in a single case, it multiplies the improbabilities a hundred fold that two such unusual cases should occur together and be alike—for considering the difference in duration they are as nearly alike as two cases of any disease usually are. If this be syphilis, is it inherited or acquired? If inherited, how did the other children escape it? There are three children older than Hannah, and three between Hannah and Hattie who are healthy, evidently free from any taint, as is also the mother. If acquired, again I ask why should all but two escape, for syphilis is many times more contagious than leprosy? The mother, more endangered than the rest, would almost certainly have contracted it.

It must be admitted that there is much to be said in favor of the view that these cases are actually lepra. We have the spontaneous amputations in both the upper and lower extremities, the plantar ulcer, the dysesthesia, the pemphigoid eruption on back of elbow with its resultant anesthetic scar; the thick, black, hard offensive crusts that form on the ulcerous sores, the distorted direction of the toes, the ulcerations of the nose and mouth, the weak eyes and peculiar voice, and the eruptive colorations. It is the exception and not the rule that so many evidences of the disease are found. Moses, of old, would have dealt with them as lepers on the discovery of far fewer and less characteristic symptoms than these, and without his camp would their habitation have been.

If I have wearied you with a paper of too great length, I have done so because impressed with the practical importance of the subject. For there is no doubt but that leprosy is on the increase, not only in other countries, but also in our own. If what I have shown you is leprosy, let us do what we can to set aside all ignorant fear of the malady. In the face of a disease which has for ages been accounted one of the most dreadful of plagues, it is not surprising that the public should be stricken with panic. On the other hand, let us profit by the experience of the past and urge the adoption of measures that will be certain to prevent its spread. If what you have here seen is not leprosy, let us free these people from the odium of such suspicion. If it is syphilis, let us cure it. And if neither, let us find out, if possible, what the disease is that has thus wrecked the life of one, and so threatens another with the same fate, and in which decomposition, by such a frightful anticipation, has wrought its work without waiting for the grave.

STATE PROVISION FOR EPILEPTICS.

Read before the Medical Society of Virginia, Sept. 4, 1895.

BY WILLIAM FRANCIS DREWRY, M.D.

FIRST ASSISTANT PHYSICIAN CENTRAL STATE HOSPITAL; MEMBER AMERICAN MEDICO-PSYCHOLOGICAL ASSOCIATION; AMERICAN MEDICAL ASSOCIATION; MEDICAL SOCIETY OF VIRGINIA, ETC.

PETERSBURG, VA.

The purpose of this paper is to direct attention to that neglected and abandoned class of defectives, known as epileptics, and I plead from the standpoint of physician, humanitarian and political economist, for a betterment of their condition. It is, however, beyond my power to convey in written words, a proper idea of the abject wretchedness of many of these unfortunates. I hope others may be convinced, as I have been, that no other afflicted beings are in such urgent need of special institutions for their care and treatment.

Epilepsy is to the physician, the statistician and the sociologist, alike, an unknown and unknowable factor. As a concomitant of idiocy,[1] insanity and crime,[2] this blight upon the human race assumes enormous proportions.

PROGNOSIS.

The etiology and pathology[3] of epilepsy being so little understood, the treatment must be more or less empirical. However pessimistic it may seem, the prognosis of the disease, so far as permanent recovery is concerned, is seldom favorable.[4] No disease is more intractable to therapeutic measures alone. The larger one's experience with it becomes, the deeper this conviction is fixed. Few chronic diseases, however, are more amenable to improvement, provided judicious treatment, prophylactic, medical and moral, is faithfully carried out. The insidiousness of its inception, the subtlety of its progress, its practicable incurability, its hereditary nature, its demoralizing effects, combine to make it one of the most dreaded maladies. And, in the language of Sachs: "The frequent development of dementia, idiocy or of epileptic insanity, in epileptics, makes the outlook gloomier still."

PREVALENCE OF EPILEPSY.

It is certainly a very widespread disorder. No accurate data can be procured upon which to estimate the proportion of epileptics to the general population. For obvious reasons, little reliance can be placed on the census reports. In this country the usually accepted ratio is 2 per 1,000 of the population. Some authorities, however, think it is much greater than that.[5] One hundred and thirty-five thousand epileptics! What an enormous army of unfortunates distributed throughout our land, a great majority of whom are in a more or less helpless con-

dition. Supposing 10 per cent.[6] of these are insane and cared for in hospitals, there would still remain 122,000 of these afflicted beings hidden away in private families, brooding over their fearful malady, or confined—merely sheltered, fed and clothed—in the poorhouses, or wandering about in hopeless, abject misery—all waiting for some sympathetic soul to lead them to a happier condition of life.

EPILEPSY IN VIRGINIA.

Virginia has her proportion of these defectives. In the three hospitals for the white insane there are 115 and in the hospital for the colored insane 85, or a total of 200.

After repeated and persistent efforts, I ascertained that in forty out of sixty county poorhouses heard from, there are forty-five white and fifty-three colored epileptics, or a total of ninety-eight. In the county poorhouses not heard from, and in the city almshouses, there are probably as many more. The actual number, then, known to be in the State hospitals and in forty of the county poorhouses is 298. Add to this, the probable number in the city almshouses and in the rest of the county poorhouses, and the number of epileptics now being cared for in our public institutions would certainly reach 400.

Now, as to the number of epileptics outside of institutions—those scattered throughout the State in their own families—there is no means of knowing. In order to arrive at something like an approximate estimate of the number, I sent communications to 200 representative physicians distributed in every county throughout the State, asking the number of these patients in their respective localities (or practices) and the probable proportion to the general population. I received responses to about half of my letters. Ninety-three physicians reported an aggregate of 340 or an average of 3.5 for each. Ten of these physicians had no cases at all. Supposing the 107 who did not respond, had no cases, then the average for each of the total number, 200, would be 1.7 per cent. In brief, for every two physicians there are probably three epileptics. In some localities the disease is scarcely known, while in others it is quite common. I use in my calculations only the information gathered from those physicians who do not practice near each other, so that it is barely possible that any case was reported more than once.

The prevailing opinion among the ninety-three practitioners from whom I heard, was that there were three epileptics to every thousand of the population, or nearly five thousand in the entire State. Even if this estimate is twice as large as it should be, the fact would still remain that epileptics constitute a very large part of our defective classes. In my opinion the number would certainly reach 3,000.

MEDICO-LEGAL ASPECT OF EPILEPSY.

In the medico-legal aspect of epilepsy a singular indifference exists, yet the victims of this disease constitute an uncertain and dangerous element in society.[7] Many breaches of the law and of the peace are closely connected with a vitiated epileptoid condition ranging from masked epilepsy to the genuine *grand mal*. The mental aberration in epilepsy may vary from the slightest deflection to the most profound dementia or furious mania. The epileptic dyscrasia betrays itself in sundry peculiar ways, and no one can tell when or how a sudden insane impulse may possess the erratic victim of fits. Some of the most revolting crimes have been committed by epileptics,[8] not, however, through the innate depravity and wickedness of the individual *per se*, but owing to the strange protean manifestation of his disease. MacDonald, in his "Abnormal Man," is right when he says that they should be separated from other prisoners and treated medically.

MISFORTUNES OF EPILEPTICS.

The life of an epileptic is, to a great extent, a secluded one, because a cruel irony of fate has ordained that the suddenness, the irregularity and the distressing character of the attacks often interfere with his plans and expectations. Shunned and neglected, left to himself to ponder over his hopeless malady, he grows up in ignorance, idleness and misery. The very nature of his affliction debars him from enjoying equal privileges and advantages with his more fortunate fellow-beings. The avenues of employment open to others are frequently closed to him.[9] Deprived of many social advantages, opportunities for acquiring an education or a trade, denied the privileges of the church and places of amusement, many epileptics eventually deteriorate mentally, physically and morally, becoming, finally, charges upon the public.

BURDEN ON THE FAMILY.

A victim of fits is an unconcealed skeleton at home, an object of ceaseless anxiety, requiring constant oversight. He is a menace to the happiness and comfort of any family. His presence is disturbing and distressful. How horrible and despairing to loving parents is this specter of a hopeless epilepsy! At home it is, for obvious reasons, impossible to give the attention and treatment that the welfare of these patients demands. Even in the families of the rich, they are deprived of the advantages essential to their well-being. But a large proportion of these families are already in poverty and absorbed in struggles for a livelihood, hence the caring for a dependent who can contribute but little more than nothing to his support, becomes a heavy and grievous burden.

On account of the peculiar and distressing character of their infirmity, epileptics are refused admission to general hospitals.

POORHOUSE AN IMPROPER PLACE FOR EPILEPTICS.

They should not be classed with paupers, because, in most instances, if opportunities are offered, they are able and willing to earn a livelihood. To the other inmates of the almshouse, epileptics are certainly very objectionable and sometimes dangerous. Moreover, these institutions, being without resident physicians, experienced nurses and hospital equipments, are not prepared to give the care and treatment these patients, from the peculiar nature of their disease, should have.

THE INSANE ASYLUM NOT THE PLACE FOR EPILEPTICS.

They are not, unless their disease is allowed to go on unchecked, which, unfortunately, is too often the case, devoid of intelligence. It may be that only about the time of the attacks they are incapacitated for the ordinary duties and privileges of life, while during the intervals they may possess even marked intelligence and mental capacity. History records some remarkable instances of this kind.[10]

Any one who has had any practical experience with epileptics and the insane knows that it is unwise to mingle them, such association being injurious

to both classes. *Every principle of humanity and justice revolts against this indiscriminate commingling of lunatics, paupers and epileptics in the same institution.*

THE STATE THE BEST GUARDIAN OF EPILEPTICS.

What to do for this needy and troublesome class of the population is a question worthy of our deepest consideration. Protection and aid to the victims of the malady, as well as to society in general, demand that provision of some kind be made for their care.

The State government is well adapted to deal with the subject and should be called upon to take it in hand, and should be urged most earnestly to give it that attention which its importance truly demands.

In the onward march of charity, benevolence and civilization, human suffering of almost every other kind has received governmental aid, and it is a reproach upon this age of progress and enlightenment that almost nothing has been done to alleviate the pitiable condition of epileptics. It is pleasing, however, to know that in some quarters of the globe interest in them has been awakened, and that this interest is gaining ground.

The question naturally arises, what is the wisest method of giving this much-needed help to epileptics?

INDUSTRIAL COLONY FOR EPILEPTICS.

After years of experience and actual operation, it has become a recognized fact that the special requirements of epileptics are nowhere so well met as in the so-called farm-colony. The prime objects of such a colony are to give each beneficiary the advantages of the most scientific medical treatment, the most humane custodial care, means of regular productive employment and facilities for acquiring an education or a trade. To accomplish these objects, palatial structures are not necessary. Plain, inexpensive pavilions, or cottages, natural and homelike to most of the inmates, shops and other buildings for various industries, a hospital for the sick and the infirm, halls or gymnasiums for recreation and amusement, chapels, schoolhouses, etc., all arranged on the village plan, and attached thereto a large farm, properly equipped, meet the requirements admirably. For those who become insane, isolated buildings of a suitable character should be provided. In such an institution, the beneficiaries would not suffer the ignominy attached to the pauper class, for they would be in a degree, producers and not absolutely dependent.

ORIGIN OF THE EPILEPTIC COLONY—CARE OF EPILEPTICS IN OTHER COUNTRIES.

The pioneer in this noble philanthropy was a French clergyman,[11] who, in 1848, conceived the idea of grouping the indigent epileptics of his parish in pleasant, homelike buildings, erected on a farm, where medical treatment, agreeable industrial pursuits in the open air, regular habits, proper diet and hygienic surroundings would, he thought, prove efficacious in lightening the burdens of the afflicted inmates.

Inspired, doubtless, by the worthy example set by this beneficent man of God, and encouraged by the success attained in France, another Protestant clergyman[12] was instrumental in establishing, in 1869, the now justly celebrated Bielefeld epileptic colony, in Germany. This colony, after which many others have been, to a great extent, modeled, consists now of a farm of 1,350 acres, upon which are dotted here and there, in irregular but picturesque manner, amid groves and gardens, orchards and vineyards, cottage homes adapted to the various grades of patients, 1,200 in number, whose lives are passed in useful occupations, pleasant diversions, learning trades, going to school and in making other efforts to become useful and happy citizens. For the men there are thirty or forty different avocations, and for the women a dozen or more. This diversity of occupation furnishes ample opportunity for each beneficiary to engage in whatever best suits his taste and requirements. Infirmaries for the sick and feeble, and separate buildings for those who become excited or insane are provided. The labor of the patients contributes so much to the support and growth of the colony that it has become, in a great measure, self-sustaining. Says Peterson: "For nobility of conception and success in results, this wonderful charity has nowhere an equal."

Within the last two decades a number of these "colonies of mercy" have sprung up in Germany, France, Holland, Switzerland, England[13] and Sweden,[14] all of which are doing a grand work for suffering humanity.

CARE OF EPILEPTICS IN THIS COUNTRY.

This country, progressive in almost everything and abounding in charity, has been singularly slow in recognizing her duty to the thousands of epileptics scattered everywhere throughout our land. True, a few humanitarian associations and legislative enactments have for their object the mitigation of their wretched condition, but there is little tangible proof of our real sympathy for these afflicted and abandoned fellow-creatures.

The first decided step made on this continent and probably in the world, in the humanitarian care of epileptics, exclusively by the State, was made by Ohio. She opened, in 1893, her hospital for epileptics. The plans adopted contemplate the erection of thirty-six buildings for patients, a number of shops to provide opportunities for the industrial and educational training, as far as practicable, of all the indigent epileptics in the State. In time more land will be purchased in order to enlarge the facilities for employment of the inmates and to supply the institution with all needed vegetables, fruits, etc. Already nine pavilions have been completed and are occupied by 500 patients, whose condition, I am informed by the authorities, has very much improved under the care, proper diet, systematic medical treatment, proper hygienic surroundings, regular exercise, all of which they have the benefit of daily. The medical treatment is conducted by experienced physicians, who are making careful scientific investigations that will in time bear good fruit. The Ohio Hospital for Epileptics, sane and insane, is a recognized success and blessing.[15]

With high resolve and determined purpose, Drs, Frederick Peterson and W. P. Letchworth, backed up by the State Board of Charities, were instrumental in getting the New York Legislature of 1894 to recognize the State's obligation to these unfortunate people. The result was the establishment of the Sonyea colony for epileptics, which with its 1,800 acres of fertile land, abundant water supply, healthy surroundings, cottages, workshops, schools, churches, etc., possesses excellent advantages for the proper accommodation of several hundred epileptics. The objects

of this great colony are to "provide gratuitously the humane, curative, scientific and economical treatment and care of dependent sane epileptics." It is thought that this institution will in a few years become self-supporting.

The last Legislature of Massachusetts, just and generous, authorized the establishment and maintenance at the public expense of a hospital home for epileptics.

The hospital cottage at Baldwinsville,[16] Mass., though a private benevolent institution for non-insane epileptic children, receives a liberal donation from the State.

In California,[17] Pennsylvania,[18] Maryland,[19] Minnesota and Michigan,[20] limited provision, on the industrial and educational plan, has been made at the respective State institutions for the feeble-minded, for the care of sane epileptics. Illinois, Wisconsin and other States are being urged by their respective medical societies and boards of charities to erect separate institutions for epileptics.

VIRGINIA'S DUTY TO HER DEPENDENT EPILEPTICS.

Will Virginia, upon whose soil was erected the first hospital on this continent exclusively for the care of the insane, and who built the first and still has the largest asylum for insane negroes in the world, be any longer derelict in her duty to her poor epileptics? Will she refuse to respond to the cry of these unfortunates? I believe not.

The State care of epileptics is a subject worthy of the most serious and earnest thought and is of the deepest interest to all the people. Whether this care should consist in a hospital, pure and simple, or a colony on the plan I have outlined, or whether special accommodation should be provided at institutions for other defectives—the insane or the feeble-minded—are questions for mature consideration.

SUGGESTIONS.

In an article published in the *Virginia Medical Monthly*, September, 1894—"Care of Epileptics on the Colony Plan,"—I advocated the State care of all dependent epileptics, in an institution exclusively for them. I reiterate the opinion expressed in that paper, viz., that a farm-colony, conducted on the industrial and educational plan and provided with every facility for the most scientific medical treatment of the patients, as sketched in the foregoing pages, would meet the requirements better than any other method yet suggested. *It is feasible, it is economical, it is humane. It has been tried elsewhere and demonstrated beyond question to be a practical success.*

Who should reap the benefits of such an institution?

1. The epileptics now confined in the hospitals for the insane. By removing these, 200 in number, sufficient room would be gained at the institutions to accommodate probably all the insane of the State in need of care and treatment, at least for a year or two.

2. All the epileptics now in the county and city poorhouses—certainly as many as 200.

3. Dependent sane epileptics, each county and city to have at the colony a number of patients proportioned to its population.

4. A limited number of pay patients, probably, who may be in pressing need of special treatment and care.

5. Both white and colored epileptics—separate and distinct provision being made for each race.

To determine the question of epilepsy, proper legal proceedings should be had as in the cases of insanity. The State, however, is sadly in need of a better law regarding the commitment of the insane.

THE DUTY OF PHYSICIANS.

Our lawmakers need to be reminded of the necessity and humaneness of special provision for epileptics. Let us, Fellows of the Medical Society of Virginia, with a broad and comprehensive devotion to the general good and to individual happiness, use our best efforts in the creation of a just public sentiment regarding this matter and, as far as lies in our power, try to "raise the fallen, cheer the faint and heal the broken-hearted." Public sentiment, the potent power that accomplishes great deeds of mercy and benevolence, never arrays itself against the afflicted and suffering. Only the ignoramus or the narrow-minded bigot will dare discourage any effort to help such unfortunates. If there be any such, tell them the old proverb: "Whoso stoppeth his ears at the cry of the poor, he also shall cry himself, but shall not be heard."

It is not, I believe, Utopian to hope that in the near future our State will awaken to a recognition of her duty to her epileptics, and see the wisdom of making that provision for them which is clearly demanded by every consideration of justice, equity and philanthropy.†

† Immediately after the reading of the above paper, some discussion took place and the following resolution was offered and unanimously adopted:

"*Resolved*, That it is the sense of the Medical Society of Virginia that the State should make some special provision for its dependent epileptics.

"*Resolved*, That an epileptic institution (or colony), conducted on the industrial plan, commends itself to this society.

"*Resolved*, That a committee of five be appointed by the Chair, two of whom shall be the present President (Dr. R. J. Preston) of this society and the author of the paper (Dr. William F. Drewry), who shall present this matter to the next Legislature of Virginia and try to induce that body to give it that attention it justly deserves.

REFERENCES.

[1] Dr. E. A. Osborne, Superintendent of the California Institution for the Feeble-Minded, is authority for the statement that in his experience, epilepsy exists as a predisposing or complicating cause of feeble mindedness in over 60 per cent. of all cases. [Institution Bulletin, Feb. 1, 1894, page 18.] Mr. Miller, Superintendent Nebraska Asylum for Feeble-Minded, says he believes that epilepsy in some form permanently enfeebles more minds than all other complications. [*Charitable Observer*, Jan. 1, 1894.]

[2] According to Richter, most crimes, especially murder, burglary, common theft, embezzlement, resistance of State power, come by epileptics or in those with a tendency to epilepsy. [A. MacDonald in "Abnormal Man," October, 1893, pages 51 and 77.]

[3] Hirt, in his admirable book on "Diseases of Nervous System," says: "The structure as well as the physiologic functions of the human brain are, up to the present time, so little understood that we are far from having any sure basis upon which to lay the foundations of a cerebral pathology. Epilepsy is a fundamental neurosis, the seat of which is still unknown."

[4] The best authorities, Peterson among them, think that no more than 1 per cent. of idiopathic epilepsy in general practice get well. Sachs has seen but very few cases of absolute cure of genuine epilepsy.

[5] Osborne and others.

[6] Peterson thinks that the proportion of insane epileptics to the sane epileptics is very small, much less than 10 per cent. [JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION, Sept. 30, 1893.]

[9] In an admirable paper on the "Provisions for Epileptics," read at the National Conference of Charities and Correction, 1894, Hon. W. P. Letchworth, of the New York State Board of Charities, said that there are charity workers, whether medical or lay, who have found it almost impossible to obtain employment for those who suffer from fits, with the result that the workhouses, alms-houses, and lunatic asylums become the only places where these unfortunate people can be received.

[10] It has been repeatedly stated by writers that Handel, the great musician; Dostojewsky, the author of "The Idiot;" Petrarch, the poet and writer; Napoleon Bonaparte and Julius Cæsar, the renowned soldiers; Mahomet the Prophet; St. Paul, the great apostle, and the erratic Byron, were all sufferers from this "thorn in the flesh."

[11] Rev. John Bost, a Lutheran preacher, was the name of this great benefactor. His institution is still in a flourishing state and reflects much credit upon its creative genius.

[12] Von Bodelschwingh, a Protestant pastor, started his institution in Westphalia with one cottage and a garden, and twelve patients.

[13] Dr. William Alexander, aided by the liberality of a wealthy citizen of England, established in 1889, the Maghull Home near Liverpool, where a limited number of epileptics receive care and treatment in accordance with the most advanced theories. The results of this praiseworthy movement have been so gratifying that efforts are being made to enlarge its capacity.

In Surrey, the Countess of Meath, prompted by her generous and benevolent spirit, has established a pleasant refuge, having a capacity for about fifty, for epileptic girls and women.

In London there are one or two hospitals where recent cases of epilepsy are received or given special treatment.

The National Society for the Employment of Epileptics has purchased a farm in Buckinghamshire, upon which there are in course of erection, suitable cottages to accommodate several hundred (eight hundred, I think), sane epileptics. Separate provision will be made for adult males, adult females and children. Here will be provided "a home for those necessitous epileptics who are able and willing to work, but for whom their friends are unable to procure employment on account of the affliction which bars their admission into ordinary fields of industry."

[14] In 1892 there was built at Wilhelmsro, in Sweden, the nucleus of a home for epileptic children. The methods adopted there are those in vogue in La Force, France.

[15] There is only one State hospital exclusively for epileptics in this country—the one at Gallipolis, Ohio. In 1890 a bill favorable to the establishment of a hospital for epileptics was passed by the Ohio Legislature. The corner stone was laid Nov. 12, 1891. To General Brinkerhoff, President of the State Board of Charities, belongs the greatest credit for this noble charity, for he was untiring in his efforts to get the authorities to recognize the wants of the epileptics of his State.

[16] This was the first charity institution for epileptics in this country. It was opened in 1882 as a private benevolent establishment, with nine patients. Now there are more than one hundred little sufferers domiciled there.

[17] About one hundred epileptic children are cared for in the Home for the Feeble-Minded. The able Superintendent, Dr. Osborne, writes that "the demand for admission of epileptics has been steady, persistent and far in excess of our means to provide for their care."

[18] The St. Clement's Hospital for the care of indigent sane epileptics of Philadelphia, maintained chiefly by private donations, has been in existence for three or four years, and is doing a good work on a small scale. Steps are now being taken, looking to the "organization of a colony farm convenient to Philadelphia, on which can be erected necessary buildings, including an infirmary, workshops and separate small cottages wherein the patients, according to their mental and physical conditions, can be cared for in the most approved manner."

At the Elwyn School for Feeble-Minded, about one hundred epileptic children are being cared for in a separate building. The State Lunacy Commission, in 1893, urged the Legislature to make separate suitable accommodation for epileptics, upon an industrial basis.

[19] The Maryland Institution for Feeble-Minded will soon erect a building especially for poor epileptics. Under the auspices of the King's Daughters, a small farm colony for epileptics is being conducted near the city of Baltimore.

[20] Michigan has begun the erection of farm cottages for her epileptics and feeble-minded, to be conducted on the industrial plan.

Surgeon-General Sternberg's Annual Report.

The Report of the Surgeon-General of the Army for the year ending June 30, 1895, presents a statement of the disbursements made from various appropriations and then discusses matters of interest to the Medical Department. The following is a synopsis of the report:

Medical and Hospital Supplies.—During the past year a new edition of the Supply Table of the Medical Department was issued, in which such changes were made as seemed called for by the progress of medical science. Medical and surgical chests issued some years ago for field service were refitted and modified in their arrangement as suggested by experience in their use. Recently published medical works were sent to military posts with the view of keeping medical officers informed of current advances in medicine and surgery. The old system of weights and measures has been disused and the metric system substituted. The use of the latter was made obligatory on medical officers from Jan. 1, 1895. Post surgeons have been directed to set aside in their hospitals a special room as an operating room, or when necessary to submit estimates for the construction of such a room. The necessary appliances for fitting up these operating rooms in accordance with the requirements of modern aseptic surgery will be provided. With a similar end in view the supply department is issuing iron bedside tables with non-absorbing tops of heavy glass for use in the wards.

During the year a board of officers was convened by me to investigate and report on the form of litter found to be best suited for Army use, having in view economy, simplicity of construction, durability, lightness and adaptability for the services required. This board devised a new model which differs from that formerly accepted in weighing only seventeen instead of twenty-four pounds. The slings accompanying it are simple and detachable. It is considered that this new litter will simplify the litter drill and not only lessen the burden of the bearers, but contribute materially to the comfort and safe carriage of those who have to be transported by them.

Library.—There were presented to the library during the year 517 books and 7,792 pamphlets and journals. Total number of books now in the library, 117,263; of pamphlets, 193,031. Volume XVI of the Index Catalogue includes from "W" to "Zythus" and forms a volume of 1,104 pages. It completes the first series of this work. The manuscript of volume I, new series, is nearly ready for the printer, the usual appropriation having been made for this volume.

Army Medical Museum.—The total number of specimens in the museum at the end of the fiscal year was 32,889, of which 623 were received during the year. The museum was visited during the year by 52,091 persons.

Army and Navy General Hospital, Hot Springs, Ark.—The officers' division contains 16 beds, the average occupancy of each for the year being only 120 days. The greatest number of officers under treatment at one time was 10. The men's division contains 64 beds. Eighty-four men were treated during the year, 33 of whom continued under treatment at its close. Of the 51 completed cases, after deducting 6 known to have been discharged at their posts later, the percentage of recoveries was 70.6. Pulmonary cases are not improved by treatment at this hospital.

Medical Officers.—There were 98 medical officers reported as having been on duty with scouting parties and on other field service during the year.

Promotions during the year: Two deputy surgeons-general with the rank of lieutenant colonel, to be assistant surgeons-general with the rank of colonel; two surgeons with the rank of major, to be deputy surgeons-general with the rank of lieutenant colonel; two assistant surgeons with the rank of captain, to be surgeons with the rank of major; eight assistant surgeons with the rank of first lieutenant, to be assistant surgeons with the rank of captain. Deaths: none. Retirements: one assistant surgeon-general with the rank of colonel; one assistant surgeon with the rank of captain, for disability.

Army Medical Examining Boards were convened for the examination of officers for promotion to the grades of assistant surgeon with the rank of captain, and surgeon with the rank of major; but no board was necessary for the examination of candidates for position in the Medical Department of the Army as the number of assistant surgeons in service had not been reduced to 110, the number allowed by the Army Appropriation Bill for the year ending June 30, 1894.

Hospital Corps.—The character of the *personnel* has improved. Great care is taken to investigate the character and previous record of every man offering for enlistment, reënlistment or transfer from the line, with a view to maintain a high standard of sobriety and efficiency. A considerable reduction in the number of privates has taken place during the year, owing to the abandonment of a number of military posts. On June 30, 1895, there were only 530 privates as compared with 585 at the end of the preceding year. No examination for appointment as hospital steward was held during the year as the number of stewards available for assignment from discontinued posts rendered such examination unnecessary; nor is it probable that an examination for the position of hospital steward will be held during the current year. Thirty-three candidates for assignment as acting hospital steward were examined in October, 1894. Twenty-three were found qualified and have since been detailed; ten failed to pass. Owing to the greater number of casualties in the corps of acting hospital stewards it is probable that an examination for a few vacancies will be held during the coming fall.

The companies of the Hospital Corps at Fort Riley, Kansas, and Washington Barracks, D. C., not only afford opportunities for instruction which can not be given at the posts, but serve as depots from which men can be drawn in emergency to supply the needs of active service. This advantage was particularly shown in the railroad riots of the year.

Examination of Recruits.—The number of applicants for enlistment and reënlistment during the year was 16,586; white 15,625, negro 911, Indian 50. Of these 7,481, or 45.1 per cent. were accepted, including 44.4 per cent. of the white, 54.8 per cent. of the negroes and 94 per cent. of the Indians. Of the whites 51.4 per cent. were rejected, while 4.2 declined enlistment; of the negroes 43.2 were rejected and 2 per cent. declined. Diseases of the eye caused the rejection of 7.77 per cent. of the applicants; under weight and imperfect physique 11.46; minority 1.43; general unfitness and undesirable 3.13; bad or doubtful character or unsatisfactory references 3.14; imperfect knowledge of the English language 1.66; illiteracy 0.67.

In every thousand of the accepted recruits there were 927 whites, 66.7 negroes and 6.3 Indians; and of the 927 whites 607.8 were natives of the United States; 94.64 of Ireland, 94.24 of Germany, 31.68 of England, 16.97 of Canada, 15.50 of Sweden, 11.89 of Denmark and 11.23 of Austria. The average age of the whole number was 26.8 years. The average height

was 67.38 inches; that of the native American 67.50, of the foreign born 67.18, of the negroes 67.21. The average weight was 145.88 pounds; native whites 145.06, foreign born 146.77, negroes 149.19. The expansibility of the chest was from 34.27 to 37.17 inches; native whites 34.08 to 36.99, foreign born 34.63 to 37.57, negroes 34.25 to 36.83.

Identification of Deserters.—From January 2 to August 17, 1895, the whole number of identifications was 66, including 8 cases of men who had left the service. The 66 represented the "repeating" element of 2,493 recruits whose outline-cards had been examined: *i.e.*, of every thousand recruits enlisted from civil life 26.47 were identified through the outline-card records as deserters, military convicts or otherwise bad characters.

Health of the Army.—The health record of the Army for the calendar year, 1894, is a most satisfactory one. Taken as a whole, it may be said to be the best annual record ever consolidated from returns sent in by U. S. Army medical officers; for although the death rate is a fraction higher than the lowest rate ever recorded, the other rates are by far lower than they have ever been before in the history of our Army. The number of admissions per thousand of mean strength was only 1,089.73 as compared with 1,289.04 during the calendar year 1893, and with 1,376.89 the average of the years of the previous decade. The rate of admission for injuries was as large as usual; but the reduction in the number of cases of disease was most gratifying, the admission rate having been only 845.42 per thousand of strength as compared with 1,048.01 and 1,121.06 respectively for the previous year and the years of the previous decade. The rate of non-efficiency or constant sickness was only 34.49, contrasting favorably with former reports, 40.15 in previous year and 42.51 as the average of the previous ten years; and the average number of days lost on account of disability by each man of the Army was only 12.6 as against 14.7 in 1893 and 15.5 in the previous ten years. That this reduction in the sick rates was not effected by the discharge of sick men on certificates of disability is readily seen, for the number of men so discharged was less than in any previous year, 13.30 per thousand of strength including 2.89 for injuries, as against 14.93 in 1893 and 26.48 as the average annual rate of the ten years immediately preceding. The lessened rates can be attributed only to the greater care in the selection of recruits and in the preservation of the men from insanitary influences subsequent to their enlistment.

The death rate from all causes was 6.69 per thousand of strength as against 6.91 and 8.22 for the previous year and decade. The death rate from injury was 2.13, so that the rate from disease was 4.55 as compared with 4.01 of the previous year, 3.95 of the year 1889 the lowest recorded rate for disease, and 5.64 the average rate of the years of the previous decade.

Infectious diseases, general and local, gave an admission rate of 273.51, or one-fourth of total admissions, while causing one-third of the non-efficiency, showing in this that although the rates have been much reduced this year there is considerable room for improvement by the suppression of infection. To the high rate of these infections, venereal diseases contributed 80.43 per thousand of strength, while malarial diseases gave only 74.72, a notable fall from 114.50, the average of the previous ten years. Injuries took second place as causes of admission with a rate of 244.21; diseases of the digestive system third, with 237.23; and of the respiratory system fourth, with 79.76.

As disabling factors the general and local infections were most prominent, causing 12.07 of the Army rate of non-efficiency; 5.03 of this was due to venereal affections, and only 1.88 to malarial infections. The constant disability due to injuries was equal to 7.88 per thousand of strength.

The absolute number of discharges for disability was 368 as compared with 413 in 1893. Eighty of these were caused by injury; 49 by diseases of the nervous system: 44 by consumption; 43 by diseases of the locomotor system; 86 by venereal disease, and 34 by diseases of the organs of special sense.

The deaths numbered 185 as compared with 191 in the previous year. Fifty-nine of these were due to accidents; 49 to infectious diseases, general and local; 20 of these were due to typhoid fever and 17 to consumption; diseases of the nervous system 24, of the respiratory organs 19, of the circulatory system 15. Eight deaths were caused by alcohol and its direct results.

The mean strength of the Army during the year according to medical reports was whites 22,904, negroes 2,086, Indians 386; total 25,376. The admission rate of the negro troops was considerably less than that of the white soldiers, 811.60 as compared with 1,116.44; and this lower rate was due to the relative freedom from disease, for their admission rate for injury was as high as that of the white troops. Their number constantly sick was 25.93 per thousand while the corresponding rate among the whites was 35.18; and the average number of days lost by each on account of sickness or injury was respectively 9.5 and 12.8. The rate for discharge also was lower among the negroes, 9.40 as compared with 13.56 among the white troops. There was little difference in the death rate of the two races. This is the most favorable showing yet made by the statistics of sickness among the colored troops of our Army.

The number of Indians was so small that it is unnecessary to dwell on their statistics. Their death rate was exceedingly high, 20.27 per thousand, due as in previous years to consumption, pneumonia and injuries.

Health of the Military Departments.—The admission rates of the military departments varied from 713.49 per thousand of strength in the Department of Columbia to 1,470.94 in the Department of Texas. The light sick rate of the negro troops mentioned above, was particularly marked in the Departments of Dakota and the Colorado, where the admission rates were only 656.31 and 665.63 respectively. In the Department of the Platte, on the contrary, the negro admission rate, 1211.12, was higher than the Army average. In Texas, which had the highest admission rate, and in the Columbia, which had the lowest, there were no negro troops. The two departments last named had also the highest and the lowest rates of non-efficiency or constant sickness, 50.27 and 23.56 daily sick per thousand of strength. The Departments of Dakota and California had 28.79 and 30.68; the rates of the other departments did not differ much from that of the Army as a whole. The death rates varied from 4.80 in the Department of the Colorado to 13.99 in Texas. In the Departments of Dakota and California the death rates were lower than the average of the Army, 6.69; in the other departments they were higher. The rate of discharge for disability was lowest, 6.76, in the Department of the Platte, and highest, 24.22, in the Department of Texas. In the others it did not vary much from the average. The Department of Columbia had the best record for the year; the Department of Texas the worst.

The Highest and Lowest Rates at Individual Posts.—As noted in summarizing the statistics of sickness in the military departments, the post of Key West Barracks had the highest admission rate, 2,226.89 per thousand of strength. This post was reëstablished in 1893, during which year its rate was but slightly in excess of that of the Army. The high rate of the past year was due to an epidemic of dengue. Only two other posts had the admission rate for the year in excess of two entries per man of the average strength, Camp Eagle Pass and Fort Myer. During the previous year no less than ten posts had such excessive rates and among them were three of the largest in the country, Columbus, Jefferson Barracks and Davids Island. Columbus Barracks had the highest rate of non-efficiency, 66.66 per thousand of strength. This, however, must be considered as a great improvement in the record of this station as, in the five years immediately preceding, its rates varied from 71.98 to 92.74. Three other posts had more than 6 per cent. of their strength constantly sick; Key West Barracks, Camp Eagle Pass and Fort Hancock. The first in 1893 had a rate but slightly larger than the average of the Army, but the others have always had high rates. Among the larger posts, Fort Custer, Vancouver Barracks, Fort McPherson and Madison Barracks had the lowest admission rates during the year; and among the smaller posts, Forts Mason and Trumbull. Fort Custer and Madison Barracks had the smallest rates of non-efficiency among the larger posts. The constant sickness at the first named was less than 1 per cent. Forts Yellowstone, Trumbull, Stanton, Canby and Mason had the best records in this respect among the smaller posts.

Diphtheria.—At Fort Yates, sixteen cases were reported from the old and crowded infantry barracks, while the men in the light and roomy cavalry barracks were exempt. Every year for several years back, diphtheria of a deadly type has visited one or more of the families of enlisted men at West Point, N. Y. This year has proved no exception. In one family the mother and six children were affected; one of the latter died on the morning after medical attendance was called in. In another family four children were affected. Of these eleven cases, ten recovered under treatment by antitoxin.

Typhoid Fever.—During the calendar year 152 cases, of which 20 were fatal, were reported. This does not differ from previous annual reports. Fort Sam Houston had 31

cases, Fort Sheridan 24, Fort Leavenworth 11. Regarding the disputed question as to the nature of the fever sometimes reported as "Texas fever," Major L. M. Maus has contributed a study of the cases at Fort Sam Houston which leads him to the conclusion that the fever so reported is an atypical enteric fever. A case of this Fort Sam Houston fever imported into Fort Clark was studied by Major H. S. Kilbourne and shown to be one in which enteric fever was complicated with malarial infection. Captain W. B. Banister reports the fevers at Fort McIntosh as enteric. The reports of these medical officers are of interest and value.

Anthrax.—Lieutenant C. C. McCulloch furnished reports of two cases of this rare and fatal disease in the human subject. The persons affected were civilians in Rio Grande city.

Diarrheal Diseases were not unusually prevalent. Camp Eagle Pass and Forts Hancock and Clark had the highest rates. The cases at the last mentioned post were complicated with malarial infection.

Malarial Diseases.—The admission rate was 74.72, as compared with 93.64 in 1893, and 114.50 the average annual rate of the preceding decade. Usually the Department of Texas has the highest rates, but during the past year the Department of California had the highest relative prevalence. The exposure of the troops during the railway riots of July and August, 1894, was undoubtedly the cause of this increased prevalence in the Department of California.

Rheumatic Affections.—The rate for these affections was somewhat less than during the previous year. The cases were evenly distributed in the departments.

Venereal Diseases.—The admission rate for these diseases in the Army was 80.43 for the year, causing a rate of 5.32 constantly sick per thousand of strength and occasioning 36 discharges and one death. The admission rate is higher this year than it has been for a long time. In 1893 it was 73.08; in 1892, 76.73; in 1891, 72.46; in 1890, 75.22; and the average annual rate for the decade ending with the last mentioned year was 79.09. Although the number of admissions was greater than usual during the past, the number discharged for disability was considerably less, 36 as compared with 53.53, 46 and 71 respectively in the four years immediately preceding. These diseases were less frequent among the negroes than among the whites or Indians, the admission rates being respectively 47.46, 82.21 and 152.85. One-seventh of the whole number of cases owed their origin to syphilitic infection and had an average duration per case of 40.17 days; one-sixth to chancroidal infection with an average duration of 34.71 days, and over two-thirds to gonorrheal infection with an average duration of 20.70 days.

Alcoholism.—The prevalence of alcoholism in the Army continues to decline. The admission rate for the past year was 30.94 per thousand of strength as compared with 33.97, 37.23, 40.01, 40.73 and 41.41 in the five preceding years and with 56.68 in the decade ending with 1889. Again, in 1890 no less than seventeen posts had more than 10 per cent. of their average strength under medical care for drunkenness; in 1891, eleven posts; in 1892, ten; in 1893, seven, and during the past year only four. Captain W. H. Arthur reduced the statistics of alcoholism at Vancouver Barracks by dealing with drunkenness as with acute poisoning. The stomach was emptied by the stomach pump and washed out with a warm 2 per cent. soda solution, after which the patient was given a bowl of hot beef extract with cayenne pepper. He was then generally able, although perhaps unwilling, to go to duty.

Consumption.—Seventy-five men were admitted to sick report during the year for consumption; 44 were discharged and 17 died. The admission rate per thousand of strength was 2.96, as compared with 2.85 in 1893, 4.34 in 1892. During the past three years consumption has been more prevalent in the Army than usual, on account of the susceptibility of the Indians to this disease.

Injuries.—The admission rate for injuries per thousand of strength was 244.21, with a total of 80 discharges (26 of which were for hernia) and 59 deaths. The rates for the various races did not vary much from the average, nor does that of the past year differ much from those of the preceding decade. Ten homicides were reported—5 whites, 3 negroes and 2 Indians; 18 suicides—15 whites, 1 negro and 2 Indians.

The Influence of Age, Arm of Service, Nativity, and Length of Service on Liability to Disease.—The report contains a series of tables based upon the statistics of the calendar years 1890-95, which show the relation of certain specified diseases and classes of disease to arms of service, length of service, age, and country of birth of the soldiers comprising the Army. The figures given in the tables are the average annual rates per thousand of strength for the period stated. The change in the *personnel* of our small Army takes place so rapidly on account of the short term of service, discharges by purchase, desertion and other drains that the ratios may be regarded as the annual rates of an army of 135,338 men instead of the average annual rates of one of 27,067 for a period of five years. These tables are therefore of greater value than those formerly published, although the absolute numbers under many of the headings are yet too small to give satisfactory ratios.

Troops on Active Service.—During the period of the railroad riots, July 3 to 18, 1894, 10 troops of cavalry, 4 batteries of artillery and 23 companies of infantry operated from a camp on Lake Front, Chicago, Ill. A hospital of 20 beds was established. The wards were floored and furnished with field cots, blankets and mosquito bars. Outlying detachments serving without attached medical attendance were visited daily by a medical officer who held sick call and telegraphed to the field hospital for an ambulance in case it was found necessary to send in any of the sick for care and treatment.

About the same time 2 companies of cavalry, 5 of artillery, 1 of infantry and 3 of the Marine Corps were concentrated at Sacramento, Cal. The dining room of the railroad depot was converted into a hospital. This command suffered much from malarial fevers in August.

Classification of Diseases.—Until recently, the classification of diseases and injuries used by the Surgeon-General's office was based on that of the College of Physicians and Surgeons of England. This system which was adopted a number of years ago is now inconsistent in many points with our present knowledge of the causation and processes of disease. Such divisions and subdivisions as zymotic, miasmatic, enthetic, zoogenous, etc., belong to a past era in the progress of medical knowledge. A new system of classification of the causes of disability has therefore been drawn up and has been used in the statistical tables presented with this report.

Uniformity in Medico-Military Statistics.—An International Commission of military medical officers met in Buda-Pesth in September, 1894, under the chairmanship of Lieut-Col. J. S. Billings, Deputy Surgeon-General, U. S. A., and came to an agreement as to the character of the statistics to be published for comparative purposes by each of the countries participating in the convention. A series of ten international statistical tables were issued for the consideration of the various military medical departments and for adoption if approved. These tables have been examined by the Surgeon-General and approved with certain modifications, the chief of which is the consolidation of the second with the third, and of the sixth with the seventh, as giving a better view of the facts represented. The Commission suggested that the various departments begin publication with the statistics of the calendar year, 1895; but as all the needful data were readily available, the Surgeon-General submits with his report the statistics of the past year in eight tables, such as will satisfy the requirements of the Commission and permit of ready comparison with the medical statistics of other countries.

Surgical Operations.—The reports of operations performed show that medical officers are fully alive to the requirements of modern aseptic surgery, and even at isolated and frontier posts have, in the operations they have been called upon to perform, endeavored to carry out the principles of asepsis with the apparatus at hand. Many interesting cases have been reported, particularly in the line of abdominal surgery. Among them are ten cases of typhlitis or abdominal abscess, of which six recovered after operation, three died notwithstanding operative interference, and in one case the perityphlitic condition was not recognized during the life of the individual.

Quarters.—Most of the suggestions of medical officers during the past year have been directed to the prevention of over-crowding and the improvement of ventilation. Crowding was noted specially at St. Francis Barracks, Forts Sheridan and Sill; defective ventilation at Angel Island, Fort Robinson and Vancouver Barracks. Over-crowding was reported in some of the guard-houses, as at Madison Barracks and Forts Myer and Wingate. At the first mentioned, the guard room gives only 384 cubic feet to each of the guard and from 200 to 324 to each of the ordinary number of prisoners. At the last, the air space per man in December, 1894, was only 217 feet.

Drainage, Sewerage, Latrines, etc.—Faulty drainage is mentioned only at a few posts. At Fort Barrancas the low ground in front of the post is covered with undergrowth, the ditches draining it having become more or less clogged.

Past experience is cited as having shown that this has an important bearing on the prevalence of malarial diseases at the post and also upon mosquitoes which rise in swarms when the low ground is saturated. The swamp in the northeast corner of the reservation at Washington Barracks is also noted; but it is represented as being more harmful to the adjacent citizens than to the troops. The cellars in some of the quarters at Forts Niagara and Porter are occasionally flooded. Since the occupation of the new post of Fort Brady, Mich., the post surgeon has repeatedly called attention to the faulty drainage which permits the ashpits in the barracks to be flooded with water, particularly during the snow melting of spring. The Locust Street sewer continues to discharge on the reservation at the Presidio of San Francisco, Cal.

Water Supplies.—Deficient supply was reported from four posts. At Fort Assiniboine, Beaver Creek, from which the supply is derived, became dry in August, 1894. Water for drinking and other domestic purposes was obtained from a spring in the neighborhood. At Fort Hamilton and Columbus and Jefferson Barracks the deficient supply was remedied by improving the connections with the city mains from which each draws its water. The question of water supply at Forts Reno and Clark remains unsolved. At the former post the drinking supply is condensed from the ice machine or waggoned from Caddo Springs. The results of an examination of the water from a boring in the river bottom in August, 1894, did not differ from those of analysis of well water made in May of that year. The water was too hard for potable or domestic use. At the latter post the Las Moras Spring was twice flooded by storm water in August, 1894. In May, 1895, the masonry approaches of the foot bridge below the springs were removed. These had up to that time obstructed the channel of the creek in times of high water and favored the overflow of the springs by back water.

At Fort Myer a temporary solution of the water problem has been effected by pumping water from the Potomac near the aqueduct bridge, a contaminated supply subsequently purified by the use of Columbia and Pasteur filters in the barracks and quarters. The artesian well is understood to have been non-productive so far. Suggestions of the prevalence of typhoid fever due to impure water supplies have been reported from Forts Leavenworth and Custer. At the one post the unsedimented and unfiltered river water supplied by the Leavenworth city water works has often been condemned by medical officers. The question of a pure water supply has been under consideration by the authorities of the military prison and some borings were made, the water from which was regarded on analysis as being suitable for use if freed from suspended earthy particles. At Fort Custer the foul condition of the water supply is said to be due to the offal and drainage from the slaughter house of the Crow agency on the Little Bighorn River and from the use of the water for irrigating purposes before it reaches the post.

Food.—Very little adverse criticism on the food of the soldier or the methods of its preparation is found in the sanitary reports. Usually these reports are to the effect that the food is ample in quantity, varied in kind and well cooked. As issued by the Subsistence Department or provided for by contract the articles of the ration have been of good marketable quality.

Clothing.—The clothing issued gave general satisfaction. Marked improvement was noted at northern posts in the issue of knit wool drawers and of a less irritating quality of undershirt; but these are said to be not yet what they ought to be. The wool alone required to make suitable underwear can not be purchased for the price of that now issued.

Habits, Cleanliness, Athletic Exercises, etc.—A general appreciation of the habits of the men may be had better by a consideration of what has been said in discussing the prevalence of venereal diseases and alcoholism, than by extensive citations from the reports from individual posts. The Post Exchange is not suggested as a causative agent in the brawls and breaches of discipline occasionally reported as the result of alcoholic excesses. Usually these are attributed to the facility with which whisky can be procured in the neighboring civil settlements. As a rule, the men are clean, well set up, and soldierly in appearance. The facilities for bathing have been improved greatly of late years, so that current sanitary reports have no reference to the absence of means for this purpose, except at the recently established post of Key West Barracks, where there is only salt water bathing; and this, although valuable as an athletic exercise and recreation, is unsatisfactory for the maintenance of personal cleanliness.

ASSOCIATION NEWS.

Department and Secretary of Public Health.

To the Members of the American Medical Association:

The AMERICAN MEDICAL ASSOCIATION at its session in Washington in 1891, adopted unanimously a resolution favoring a Department and Secretary of Public Health—said Secretary to be a member of the Cabinet of the President of the United States; and appointed a committee to urge upon Congress the passage of a law for the creation of such a Department and Secretary. This committee has been continued, with slight changes, up to this time, and have prepared and presented to Congress a suitable bill, and by such methods as were open to them have endeavored to secure its passage. This bill is now pending in both Houses of Congress.

In the meantime the ASSOCIATION has pledged itself anew at every annual meeting since 1891, and notably in the annual meeting in Baltimore last May, to continue the work necessary to secure the desired legislation. Many State medical associations and many local medical societies have passed resolutions approving of the end in view, and these resolutions have, presumably, been sent to the Senators and Representatives of the respective States.

As the result of these measures, considerable interest has been excited in Congress in favor of the pending bill, but not enough to secure its passage.

Under these indicated circumstances it becomes our duty to make still further effort, and we appeal to members of the ASSOCIATION everywhere, to give us all the help they can. It certainly seems to us that if the hundred thousand doctors in the United States would unite as one man and earnestly request of Congress the passage of the bill to create a Department and Secretary of Public Health, that the enterprise could not fail of success. Surely, whatever a hundred thousand doctors would ask for would be granted.

We therefore recommend:

1. That every State medical association and every local medical society shall, as promptly as may be, pass resolutions favoring the adoption of our bill, and that such resolutions shall be published in the medical journals and copies forwarded to the members of Congress.

2. That every doctor in the United States shall address a private letter in advocacy of our bill to the senators and representatives in Congress from their respective States. Every citizen has the right to appeal to his representatives, no matter whether he is acquainted with them personally or not. Can any one believe that if all the doctors in any State were to unite in soliciting the senators and representatives of said State to pass this bill, that such solicitation would not bear good fruit?

3. The medical journals of the country, as a rule, have heretofore given us generous assistance, and we heartily urge upon them a continuance of their efforts in our behalf.

(Signed) JEROME COCHRAN, Ch'm'n, Montgomery, Ala.
C. G. COMEGYS, Cincinnati, Ohio.
N. S. DAVIS, Chicago, Ill.
J. C. CULBERTSON, Cincinnati, Ohio.
LISTON H. MONTGOMERY, Chicago, Ill.
CHARLES DENISON, Denver, Colo.
U. O. B. WINGATE, Milwaukee, Wis.
W. B. ATKINSON, Philadelphia, Pa.

(Medical periodicals favorable to the movement will please copy.)

Veratrol, $C_8H_{10}O_2$, is described as a colorless oil, of an agreeable, aromatic odor; specific gravity, 1.086; boiling point, 205° C. (401° F.). It is made by acting upon veratric acid by baryta and heat. It is soluble in alcohol, ether and oils. From researches which have been carried out on synthetic veratrol, it appears that this drug possesses antiseptic properties in respect to certain pathogenic microbes.—*Pharmaceutical Era.*

THE
Journal of the American Medical Association
PUBLISHED WEEKLY.

SUBSCRIPTION PRICE, INCLUDING POSTAGE:

PER ANNUM, IN ADVANCE $5.00
SINGLE COPIES . . . . . 10 CENTS.

Subscriptions may begin at any time and be sent to
THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION,
No. 86 FIFTH AVENUE, CHICAGO, ILLINOIS.
W. H. LOWDERMILK & CO., WASHINGTON AGENT.

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On receipt of the subscription the weekly JOURNAL of the Association will be forwarded regularly.

Gentlemen already members of the Association should send their annual subscription to the Treasurer, or direct to the JOURNAL office.

All communications and manuscript of whatever character, intended for publication in the JOURNAL, should be addressed to the *Editor*, and all communications relative to the business of the JOURNAL, proof sheets returned, or in regard to subscriptions, should be addressed to THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION, 86 Fifth Avenue, Chicago.

SATURDAY, NOVEMBER 2, 1895.

THE DEFINITION OF EPILEPSY.

The definition of a disease is generally supposed to give some adequate conception of its character, and any indefinite statement in this direction generally means that the ideas as to the disorder are vague, ill limited,or only partially understood. Sometimes, however, a name carries a sufficiently clear though general idea, as in the term insanity, while it would puzzle lawyers accustomed to every possible use of words to give a well rounded and complete definition. With the term epilepsy, however, the case is not the same as with insanity; while it conveys to every one the general idea of convulsions or their equivalents, the definitions offered by high authorities clearly show that, as indicating a distinct disease, it is hardly employed with the accuracy and definiteness that should give the proper notion of a real morbid species. One writer calls it "an affection of the nervous system characterized by attacks of unconsciousness," another speaks of it as "a disease in which there are convulsions of a certain type or sudden loss or impairment of consciousness," and still others mention various types according as they are "idiopathic," symptomatic, reflex or otherwise. All or nearly all make loss of consciousness its chief characteristic in their definitions, but only to later make exceptions for the case of partial epilepsy in the subsequent descriptions. In hardly any text-book is there a definition given that compactly and completely covers the ground as is done for most other nervous disorders; in all it is incomplete, requiring qualifications, and is often inaccurate.

What is the propriety, for example, of calling epilepsy a functional neurosis, and distinguishing as a separate type all cases in which any gross organic disease can be recognized, when the connection of the convulsions with the latter is at best only assumed? A cerebral tumor localized in the brain, as a rule, no more demonstrates its exact relations with an epileptic attack than does an overloaded stomach or a diseased kidney; not, in fact, so much, since in these latter cases we can assume a toxic or disordered condition of the blood that may act directly upon the unstable nerve cells. Nor is there any more propriety in separating Jacksonian from generalized epilepsy, as the lesions may be as obscure in one case as in the other. The same may be said of infantile convulsions, which are only the reaction of an immature brain with undeveloped inhibitory powers to morbid irritations, or of the senile convulsive attacks due to the regressive changes of old age. Epilepsy is simply and solely the symptom of cortical instability from whatever cause, and if it is ever exceptionally subcortical in its origin it must be due to the same irritability affecting the ganglionic representatives of the cortex in the basal portions of the brain. The normal cortical cells, while a source, so to speak, of energy, are so balanced and controlled that these explosive morbid phenomena must be due to some actual physical disorder, whether this be from imperfections in development or from acquired defects through innutrition, intoxication, etc., as well as from gross disease. With modern methods we are likely to learn more and more what these changes are, and the term idiopathic or simple epilepsy will be relegated to the general limbo for useless and forgotten names.

The primary condition of instability once established, the epileptic attacks, varying according to the portion of the organ involved, from general convulsions to petit mal or the psychic equivalent, may be aroused often by a slight cause, whether it be reflex, toxic, emotional, or due to the irritation of gross disease, hence the distinction of these different forms of epilepsy is unjustifiable except as a mere matter of convenience in special cases. The general definition of epilepsy that may be offered, therefore, is that it is a disorder consisting essentially in a condition of explosive cortical instability, and lack of inhibition, manifesting itself in general or local convulsive attacks, or in sudden temporary disturbances of consciousness and other psychic functions. This includes not only the physical and intellectual manifestations, but also all emotional and volitional disturbances that may have to be classed under this head. It does not unduly limit the disorder by making loss of consciousness its characteristic and it expresses the conception of what is coming to be universally recognized as the true pathology.

With this conception of epilepsy in the mind, a clearer light is thrown upon the pathology and the treatment. The futility of expecting to cure established epilepsy by simply cutting off sources of reflex irritation without attacking the primary condition is

made self-evident, as is also that of attempting to find any single uniform lesion. It is, as a clinical entity, a special form of disorder of cortical functioning, that may depend upon numerous and widely varying conditions.

ACUTE PANCREATITIS AND DISSEMINATED FAT NECROSIS.

One of the most interesting points in connection with instances of acute inflammatory affections of the pancreas is their frequent association with the condition which was first described by BALSER (*Virch. Archiv.*, Bd. 90, 1882) as disseminated fat necrosis. The opinions that at present obtain, concerning the causes of these changes in the fat tissue are succinctly stated by THAYER in connection with the report of a successful operation for pancreatitis and parapancreatic abscess (*American Journal of Medical Sciences*, October, 1895). This case is really a very important one from a clinical standpoint, because it shows the possibility and importance of an early diagnosis and operation in acute pancreatitis. It is the first case recorded in which the diagnosis has been followed by a successful operation. Since the publication of the researches of FITZ on acute pancreatitis (Boston, 1889; also *Boston Med. and Surg. Journal*, 1889) in which he studied carefully his own cases as well as cases from the literature, a number of additional instances of acute pancreatitis have been described and some observations made that throw some light on the fat necrosis mentioned, as being frequently associated with acute inflammatory affections of the pancreas.

BALSER (loc. cit.) believed that these yellowish-white, opaque, small characteristic areas in fat tissue, that he termed disseminated fat necrosis were due to an overgrowth of fatty tissue, the central parts of the fat masses becoming necrotic from lack of nourishment; he believed the pancreatic changes to be secondary, because he found fat necrosis in bodies where no special symptoms had been present during life. CHIARI (*Prag. med. Woch.*, 1893) regarded the process as degenerative, and could find no evidences of any fatty overgrowth. FITZ (loc. cit.) thinks that there is a fat necrosis without any direct relation to severe lesions of the pancreas, and also that there is an inflammatory fat necrosis which is secondary to acute pancreatitis. FITZ found in some of his cases, areas of round cell infiltration around the periphery of the necrotic foci and in some cases bacteria were also present. LANGERHAUS (*Virch. Archiv.*, Bd. 122, 1890) showed that the necrotic areas consist of a combination of lime salts with fatty acids and he advances the plausible suggestion that the process may take place as the result of the action of the fat splitting from the pancreas upon the fat tissue, the fatty acids afterward combining with lime. Indeed, he states that he was able to produce similar changes in the subcutaneous fat of a dog by the injection of pancreatic extract. ROLLESTON (*Trans. Path. Soc.*, London, 1893) traced the cause of fat necrosis to disturbances of the trophic influences of the abdominal sympathetic system due to the extension of some morbid process from the pancreas.

BALSER (Vort. Eleventh Congress f. mat. Med., 1892) made an additional communication concerning culture experiments, which were not finished, and the final outcome of which have not yet been published. In 1891, WELCH (*Medical News*, 1891) obtained the bacillus coli communis in pure culture from areas of fat necrosis, associated with acute pancreatitis, but he did not think that the necrosis resulted from a primary infection. In a number of instances THAYER (loc. cit.) states that culture experiments by WELCH have remained entirely without positive results.

The real, exact cause, then, of these fat necroses is not entirely settled. That the process may occur without pancreatic disease is beyond question, but in such cases the areas are usually limited to the interlobar fat tissue in the pancreas and such areas may be found, as every pathologist knows, in individuals in whom there have been no symptoms pointing to the process during life. The areas can not be accounted for as due to direct infection, because cultures have proved sterile, both in instances without gross pancreatic disease, as well as in cases in which marked pancreatitis of undoubted infectious origin was present. In view of these circumstances the observations of LANGERHAUS cited above become strikingly suggestive; areas, similar to those observed in connection with pancreatitis, may be produced by the direct action of pancreatic juice upon fatty tissue and consequently a primary lesion of the pancreas, of infectious or toxic origin, may allow the escape of the fat splitting ferment into the surrounding tissue which thus causes a secondary and sterile disseminated fat necrosis. In connection with this, should be mentioned the experiments of HILDEBRAND (Trans. German Society for Surgery, April, 1895, summarized in *Medicine*, September, 1895) who deligated the splenic part of the pancreas in cats and then tied all the pancreatic veins, in order to hinder the resorption of the collected secretion by way of the blood paths, and post-mortem he always found areas of fat necrosis in the pancreas itself, and in adjacent omentum and mesentery. He obtained the same results by placing either pieces of pancreas, or the entire organ of one animal into the abdomen of another and, in one of these cases, extensive hemorrhage also occurred. The areas of fat necroses were quite characteristic. It will be seen that the results of HILDEBRAND'S experiments appear to confirm the observations, as well as the suggestions of LANGERHAUS as regards the mode of formation of disseminated necrosis of fat.

NEW YORK CITY HOSPITALS AND THEIR VISITING STAFFS.

An important change in the manner of appointment of the visiting corps of surgeons and physicians at the county hospitals of New York County is predicted. The hospitals which will be affected by the change are the Fordham, Harlem, Charity, and Gouverneur Hospitals, and all the institutions on Randall's, Blackwell's and Ward's Islands. Bellevue Hospital is excluded.

The Commissioners of Charities and Correction have decided to dismiss the medical boards in the hospitals under their control on November 1, and to appoint in the future only men recommended by the different medical colleges of the city. The term medical board, as used in the city hospitals, means the staff of visiting and consulting physicians. It is only in these posts that the changes will be made, the house staffs remaining as they have been. No change at all will be made in Bellevue Hospital, as the medical board there has, since 1882, been composed only of men recommended by medical colleges. It was the success of this practice at Bellevue that induced the Commissioners to make the change in other hospitals.

CHICAGO MEDICAL INSPECTORS.

The Civil Service Commission of the city of Chicago have postponed the examination which was advertised to take place November 7, until December 9.

The Commissioners have decided that the examinations shall conform in general to those required for entrance into the Government Medical Services. The following is the essential plan of examination, which will occupy about five days:

1. The candidate will be required to pass a satisfactory physical examination, and in addition will certify that he labors under no physical disability.

2. The candidate will then write a brief autobiography, and pass a short written examination in history, literature and physics. He will then be examined in anatomy, physiology, chemistry (including bacteriology and toxicology), general medicine, general surgery, obstetrics, materia medica (including drug adulterations) and hygiene.

3. The examination will conclude with a clinical examination at a hospital where exanthematous diseases are treated, and an accurate diagnosis of the cases will be required.

From the foregoing it is evident that the Commission intend to raise the standard. The salary of the Medical Inspector, it is understood, will for the present be fixed at $1,200 a year.

THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION.

This week we publish fifty-two pages of reading matter. The vast pile of MS. on hand in the office, admonished us once more that the space was too limited for the publication of the large amount of manuscript with which our friends have favored us. After the conclusion of the current volume, it is in contemplation to make the enlargement a permanent one, as the great success of the publication seems now to fully warrant the additional expenditure. We have not at any time thought it expedient to count the advertising pages, as making any part of the number of pages. One of our esteemed contemporaries has the habit of counting its advertising pages in order to keep pace with the JOURNAL, but the practice is too transparent to make our readers at all envious, especially when they may easily look at the number of the last page of any even date and see for themselves that no weekly medical journal in America has given its readers more medical literature than their own.

Not only has their JOURNAL given them a vast quantity of reading material, but at no time in the history of the ASSOCIATION has the quality of the articles been finer or of higher class, than it is to-day The wisdom of the founders of the JOURNAL is more and more apparent every week.

GOOD JOURNALS REPAY.

DR. ISRAEL B. WASHBURN of Rensselaer, Indiana, writes to the *Medical Journal* of that State, his view of the comparative value of journals and formal treatises to the rural practitioner:

"The country physician can use his money to much better advantage than in buying the larger treatises, by subscribing for as many good journals as he can read and, every three to five years, such works on special subjects as he needs. There are few medical books that are not 'old and gray' in five years in these days of medical progress."

Sound advice. We will add; subscribe only for journals of that high class that deserve to be preserved. Bind the journal or journals that you find the most desirable for reference. Unbound journals will seldom be consulted, and before long become a source of complaint to the housewife.

CREDIT WHERE IT IS DUE.

The obituary notice of SIR THOMAS LONGMORE which we published last week was extracted from the *British Medical Journal*, and by an inadvertence was not credited. We are glad to say that, so far as we are aware, this is the first instance on record in which an article taken from another journal was not duly credited. In our opinion there are few things more exasperating than to have articles copied from our JOURNAL without credit, or perhaps with that slipshod credit, "Ex." Some journals that are considered respectable, are hardened sinners in that regard.

CORRESPONDENCE.

A Domestic Test for Albuminous Urine.

NEW YORK CITY, October, 1895.

To the Editor:—This is the title of a paper read by the writer at the last meeting of the New York Medical Association, held in New York City, Oct. 15, 1895. Thinking that an abstract of the important part of that paper might be of some value to the readers of the JOURNAL, it is sent to the JOURNAL with the hope that you will deem it worthy of publication.

The method of making this test is as follows: pour into a test tube an inch of urine; with a dropper, drop carefully upon the surface of the urine half its quantity of alcohol. If albumin be present in the urine, a white line will form between the two fluids, the same as in the cold nitric acid test.

The other method is to put the alcohol in the test tube first, and drop as before, the urine into it. If albumin be present in the urine, it will be made known by a white wave of coagulated albumin following the urine as it sinks to the bottom of the test tube. The urine being heavier than the alcohol will gravitate to the bottom of the tube very quickly. After a small quantity of urine has been added, the alcohol will become opaque with the coagulated albumin. This test is so sensitive that the one-hundredth of 1 per cent. of albumin when present in the urine can be detected.

The writer has used this method for about a year, both in private practice and hospital work. It has been found to be the most convenient and most delicate of tests.

Mucus will be coagulated if it be present, and may be mistaken for albumin. Filtering before testing will eliminate mucus; if one is still in doubt, any of the control tests for mucus can be made. No other ingredient of abnormal urine will give any trouble, more than when any other method for testing urine is employed. Alcohol, if of the strength of 60 per cent., when clear, will answer every purpose, excepting one of delicacy.

A glass tumbler may be used when it is impossible to obtain a test tube. No heat, no acids required. So convenient is the test that the physician can not be excused if he fails to discover the presence of albumin.

The writer is convinced by a year's experience in the use of this method that if the profession will give it a trial none will be disappointed. Any doubts which may remain in one's mind, can be removed by control tests. Few of us rely upon one single test, by whatever method made.

J. G. TRUAX, M.D.

School Books on Physiology and Hygiene.

HARTFORD, CONN., October, 1895.

To the Editor:—We inclose the following report, which at this time has considerable medical interest in many sections of the country. During the past few years laws have been passed in Congress, and the Legislatures of forty-one different States, requiring instruction in the public school on physiology, hygiene and the effects of spirits and narcotics on the human body. A large number of school books have been prepared to meet this requirement, nearly all of which have been compiled and edited by medical men, many of whom are eminent in the profession.

Many of these works have been assailed in the daily press and denounced as containing errors, but the criticism so far has been limited to mere statements. The authors of these works have invited from the medical profession the most critical examination and inquiry concerning the accuracy of the facts stated.

This report is in accordance with this request, and the object (in which all medical men are interested) is to eliminate all possible errors and raise the character and accuracy of such works to the highest possible standard.

Very truly yours, H. A. B.

REPORT.

We, the undersigned physicians, have been requested to examine and report on the various school physiologies which have been introduced to comply with the laws requiring temperance instruction in common schools.

Our special attention has been directed to that part relating to the effects of alcohol, opium and other narcotics on the human body. We have received and carefully examined eight different series of books called by the following names: "The Pathfinder," "Appleton's," "Eclectic," "Union," Blaisdell," "Dulanie's," "The Health Series," and "Martin's High School Physiology."

As a result of this examination we are unanimous in opinion that the statements and teachings of these works concerning the effects of alcohol and other narcotics on the body are correct, and fully supported by the most authoritative studies of scientific investigators up to the present time.

We are also of opinion that in both letter and spirit, these works are highly commendable, particularly in the admirable groupings of physiologic and hygienic facts, with excellent illustrations and clear concise statements.

The practical character of these books commend them to us, and the interest and value of their teachings would seem to place them among the most important subjects that can be used in our public schools. (Signed.)

T. D. CROTHERS, M.D.,
Superintendent Walnut Lodge Hospital, Hartford, Conn., editor of *Journal of Inebriety*.

I. N. QUIMBY, M.D.,
Vice-President American Medical Temperance Association, etc., Jersey City, N. J.

LEWIS D. MASON, M.D.,
President of American Association for the Study and Cure of Inebriety, etc., Brooklyn, N. Y.

West Tennessee Medical and Surgical Association.

PARIS, TENN., Oct. 23, 1895.

To the Editor:—Please announce the meeting of West Tennessee Medical and Surgical Association at Covington, Tenn., Nov. 21 and 22, 1895. Very truly yours,

I. A. MCSWAIN, M.D., Secretary.

SOCIETY NEWS.

"American Medicine."

In response to a toast at the annual dinner of the Chicago Gynecological Society, Oct. 18, 1895, DR. JOHN H. HOLLISTER, said:

Let no man be over-anxious about his reputation. If he intend the right and does his best, ultimately that reputation will take care of itself and of him too. This is true of individuals—true of nations. Great as has been the progress of nations during the last 300 years, the development of America in that period has been the phenomenal fact. Cradled without parental care, it came to its estate without the help of other nations; in fact, it grew by reason of their neglect. A noble *manhood* was its only inheritance. All else is of its own creation. For nearly two centuries we were esteemed a semi-barbarous people by the crowned heads and the *elite* of Europe, and their prejudices have only been in any measure conquered by our sublime indifference.

The struggle to make for ourselves a name and a place among the foremost, has been indeed severe, but the issue is no longer doubtful. You who have met this prejudice on foreign shores know well how strong it yet remains, but you know full well that, as professional men, you have nothing left to fear, and that especially in medicine and surgery Americans have no apologies to make. We are to be courteous *ever*, but deferential or craven, if ever we were, *nevermore*.

Happily for us, American history holds no relationship with the mythical ages. Our genesis was clearly written and the successive stages of our development are sharply defined. From the landing of Columbus to this hour, ours has been a story of thrilling interest, and I am asked within these ten minutes to outline to you the agency of medical men in the accomplishment of present results. Were every page of mine a volume, the half of their records in the making of American history could not be told. Indulge me, therefore, in a little free-hand drawing while, from a single

standpoint, I seek to sketch in briefest outline the deeds of those who tower in the distance like magnetic peaks, and others hardly less conspicuous, who coming a century later command a place in the immediate foreground.

For the first hundred years and more, in our colonial history, our noted physicians were educated abroad—in Edinburgh and London and Paris. Of medical schools we had none, and yet, despite this, and in the absence of foreign culture, there grew up in these western wilds a host of doctors whose successes in the treatment of diseases in those colonial days is still a matter commanding our respect. But another day dawns. It is the eve of the Revolution! Our first scene is laid in Boston, the time June, 1775. The whole country is aflame, for a crisis is at hand.

If now there be one more conspicuous than his fellows (unless it be Samuel Adams) that man is a physician—a student of the eminent Dr. Lloyd. He is called from his profession, for Boston is in peril. He is made president of its Committee of Public Safety, soon he is a major-general, but, seizing a musket, he is foremost in the fight and falls, as a private would fall, in the battle of Bunker Hill. His name is Joseph Warren.

In the annals of our medical history the name of his brother John is even more conspicuous. He was senior surgeon in the improvising of Cambridge hospital in 1775, and cared for the wounded of Bunker Hill. He was the founder of the medical department of Harvard College in 1783. His standing as a civilian may be inferred from the fact that he was the first to pronounce a Fourth of July oration in the famous patriotic city of Boston. He was continuously the President of the Massachusetts Medical Society from 1804 to the date of his death in 1815. Following in his illustrious footsteps came another notable, his son, John Collins Warren. He took his father's chair of surgery in Harvard in 1815, and held it in active service for sixty-two years. In 1820 he united with others in the founding of the Massachusetts General Hospital. In 1828 he founded the *Boston Medical and Surgical Journal*. He introduced ether into surgical practice in 1846. He died in 1856, bequeathing his body to his school and his skeleton to his museum.

It seems a cruel thing to leave so much of other early eminent physicians of Boston unsaid. But the scene changes. We come now to Philadelphia. The time is also 1776. Benjamin Rush has studied in London, in Edinburgh, in Paris. He stands in the forefront of his profession, and a most accomplished citizen as well. Here too, in Philadelphia, the question of revolution is at fever heat. A provisional council of the State is called. He is there as a member. In that body it is he who introduced a resolution "to consider the expediency of a Declaration of Independence." He was a member of the Continental Congress in June following. He signed that Declaration as formulated by Jefferson, when men were to hang separately if they did not hang together. He was both medical and surgeon general of the central division of the American armies in that most critical period. In 1785 he founded the first dispensary in the United States. Such were his invaluable services during that terrible invasion of yellow fever in 1793 that from most of the crowned heads of Europe, as well as from his own countrymen, he commanded most flattering testimonials. Sparse as was our population in that early day, he gave instruction to over two thousand medical students, and despite its unpopularity was president of an abolition society beside.

Nor must I, in the moments that remain, forego the name of Nathaniel Chapman. Stung by the question of the *Edinburgh Review*, "In the four quarters of the globe who reads an American book, or goes to an American play, or looks at an American picture or statue? What does the world yet owe to American physicians and surgeons?" he determined that America should be heard from; and in 1820 he founded and edited the *Philadelphia Journal of Medical and Physical Sciences*, the first American medical journal, which seven years later became our well-known *American Journal of Medical Sciences*. A monument to his memory is one of the fitting things yet to be, and if, finally, it shall be an accomplished fact within his lifetime, Gihon will be happy.

With the opening of the present century, especially after the war of 1812, with the return of prosperity to our people began the marvelous development of education, and prominent among educators were those devoted to the teaching of medicine and surgery. From 1830 to the present date we founded over one hundred medical colleges. We can not better measure the progress of medicine in America in the last half century than by comparing the colleges of 1850 with those of 1895.

But, gentlemen, be it remembered that this wondrous evolution is not a matter of accident. But for those earlier colleges, the best that could then be, our present grand universities would not now have being. As I recount the planting of these medical colleges which were nearly all founded within my remembrance, the unselfish and unpaid labors of a host of men are recalled to mind—men who builded wisely in their day; men into whose labors you have entered—you hardly know at what cost. Time would fail to tell you of these men even by name—of those just passed from our presence and of those who still linger among us, full of years and of honors—by whom a great preparatory work was so well achieved. The Warrens, the Storrs and the Bigelows of Boston; the names of Valentine Mott, of Gurdon Buck, of Willard Parker, Alonzo Clark, the elder Flint, Peasley and Nathan Smith of New York; Chapman, Jackson, Dewees, Meigs, Dunglison, Horner and Gross of Philadelphia; Massey, Drake and Dawson of Cincinnati; Miller, Gibson and the Yandells of Louisville; Storrs and Jones, Bemiss and Richardson of New Orleans; Eve, Briggs and their confrères of Nashville; of Pope and McDowell and J. B. Johnson and Hodgen of St. Louis; of Brainerd and Herrick, Blaney and Freer, Johnson, Allen, Byford and Gunn, Ross, Jewell, Jackson and Parks, who have ceased from their work; and of Davis and Andrews and Isham and Bartlett of Chicago who still remain—*these all*—and their *associates* whom time does not permit me to name, have wrought with a success which you yourselves best know, for the development of American medical institutions and American medical literature.

From this list, I purposely omit the names of McDowell, Symmes, Atlee and Battey, and a list of living eminent gynecologists, knowing that from yourselves, at such a meeting as this, they will doubtless receive tributes more ample and more just—and I close with this single suggestion: your predecessors were by no means satisfied with their then present labors, but they prophesied your coming. They foresaw your greatly improved environments, your laboratories, your aseptic hospitals, your possibilities for achieving results which with them were impossible. They have left those prophecies on record, and in memory of those who are dead, we, who still live, look earnestly, hopefully and confidently to *you* for their fulfillment.

PUBLIC HEALTH.

Camp Jenner, Eagle Pass, Texas.—Passed Assistant Surgeon George M. Magruder reports to the Surgeon-General of the Marine-Hospital Service under date of Oct. 21, 1895, (Abstract of Sanitary Reports) that the camp was closed on that date and all refugees discharged.

Contributions to the Study of Trichinosis.—While the classical investigations of Leuckart, Zenke and Virchow have cleared up many points concerning the nature and pathogenesis of trichinosis, our knowledge is yet somewhat unsatisfactory as regards the route by means of which the trichinæ reach the muscles from the intestinal tract. Leuckart believed from theoretic considerations that the embryos reach the muscles by means of independent locomotion along the connective tissue bands, but this conclusion was not based on experimental investigation. In order to decide this question, Askanazy (*Archiv. fur Pathologische Anatomie und Physiologie und fur Klinische Medicin.* Bd. CXLI, Heft 1, S. 42) made use of animal experiments. He examined rabbits dead from artificial trichinosis, as well as pieces of the tissues which were removed from the intestines of rabbits, for instance, under narcosis. In this way he was able to study thoroughly the route selected by the trichina and he made the interesting observation that almost without exception only the female animals undertake emigration into the organism, a fact that corresponds well with the clinical conditions, namely that the feces contain male trichinæ in much greater numbers than females. The process was found to be as follows: the female intestinal trichinæ become closely adherent to the intestinal mucous membrane, often encircling the villi in a spiral manner and then they pass in an active boring manner into the wall until they reach the central chyle vessels which are penetrated. The birth of em-

bryo trichinæ now occurs, and only a small part of the brood is discharged in the lumen of the intestines, the majority of the young animals pass directly into the chyle vessels. From the lymphatics they reach, first, the mesenteric lymph glands and, passing this filter, they are emptied through the thoracic duct into the general circulation. It is, nevertheless, a very striking fact, that the young worms localize in the muscular tissue and, especially, that they seem to prefer certain definite and well-known muscle groups. Askanazy attempts to explain this circumstance by resorting to chemotaxis as the most rational mode of explanation. He succeeded in finding young trichinæ in small hemorrhagic lung foci where they had become arrested in the form of minute emboli. The route by which the embryo trichinæ reach the muscles is consequently not the connective tissue strands but the lymph- and the blood-vascular system. Askanazy also attempted to solve the problem of whether or not the survival of one infection resulted in any degree of immunity to succeeding infections, but his experiments as far as they went failed to show any immunity. In one case reinfection occurred in a rabbit that had survived the first infection for half a year. Several plates of colored illustrations make quite plain the observations outlined above.

Medical Climatology of Mexico.—The area of the vast territory of Mexico is 740,970 square miles, with a population of 11,632,924 souls. The country may be divided into three regions: 1, the coasts of the Gulf and the Pacific; up to 1,000 meters in height, a sandy porous soil or a sedimentary, wet, clayey soil covered with earth and very conducive to vegetation. 2, between 1,000 and 2,000 meters the large and small alluvial valleys, cultivable, some conducive to the formation of marshes; others are chalky with stunted vegetation. 3, from 2,000 to 3,000 meters, a small section of the rest of the country, with its mountains. The Mexican coasts occupy a considerable extent. Those of the Gulf measure 2,300 kilometers in length. They are very low, sandy and marshy; those of the Pacific have an extent of 9,000 kilometers. From the preceding topographic and orographic conditions it is seen that about two-thirds of Mexico lies in the temperate zone, the rest in the torrid. The low lying regions are extremely insalubrious. Palustral fevers are endemic, as is typhoid fever. These conditions are explained by the luxuriant vegetation, the tropical temperature and the excessive humidity. Among the endemic diseases of Mexico beside paludism (*cocolixtli*), are helminthiasis, yellow fever, climatic fever, tetanus, pellagra, *vomito prieto*. According to Dr. Ruiz, paludism is to be found in the region of Vera Cruz, which is covered with a tropical vegetation and has a damp warm atmosphere, as well as in the mountainous fertile region of Sonora. The only localities exempt are those having a rocky soil, good water and a low mean temperature. Yellow fever is observed on the coasts, especially from April to October. The climatic fever presents itself under different aspects according to Guyon, as bilious, inflammatory, and typhic; "but in all its phases it has a special characteristic which makes it a nosologic entity, that is, the disease is not localized in the liver nor in any other viscus, and it is not induced by the palustral agent." Syphilis is found in all social classes, and is so diffused that its victims are to be found in hamlets as well as in cities. "Mexico, the capital of the Republic," writes a distinguished hygienist, "is gaily constructed in a vast unhygienic area of the great Mexican valley." The population in 1890 was estimated at 451,246. The federal district which comprises the capital has an area of 463 square miles. The extreme temperatures are, maximum (in the shade), 31.60 degrees C.; minimum, 1.07 below zero; mean, 15.50. The general mortality rate is 40 per 1,000, and in nearly all localities of the federal district, it is even higher. The prevalence of infectious disease in this district is very marked. Of late the Superior Committee of Hygiene has advised the construction of a sewerage system, and the maintenance of pure drinking water, in order that, as Dr. Samuel Gache remarks, the mean duration of life, which now is but twenty-five years, may attain a higher figure, the resources of the country be increased and sanitary science have gained a new triumph.[1]

Cholera in Honolulu.—The sanitary column of the New York *Independent* for October 10 quotes from a recent Honolulu paper some suggestive statements regarding the spread of cholera at the place named. The fountain head of the disease was among the Chinese on the SS. *Belgic* where it was limited and stamped out, but extension to the native population was not prevented. The exact method of this extension has not been satisfactorily explained, but the following has been offered as showing certain of the unusual environments of that community, as well as certain of the life-endangering habits of the native population:

"Mrs. Emma M. Nakauina, an intelligent and able half-white lady, and one of the highest authorities on such topics, has written an article for the *Pacific Commercial Advertiser* of September 5 that seems to afford a satisfactory clue. She takes as a starting point the fact that the Chinamen who died at quarantine, died of undoubted cholera. The practice has been to bury quarantined persons, without coffins, on a sandspit very near to the home of certain women who make a business of gathering and selling in the fish market crabs, limu and mud fishes. Among these crabs are two varieties that are described and named with a word that means 'corpse-eating,' from their well-known fondness for animal matter, especially decaying human flesh; and these crabs have been met at night half a mile inland from the sea, seeking decomposing animal matter; and the natives bury their dead far inland to preserve them from the ghoulish raids of these creatures. At the very beginning of the epidemic a festivity known as a *luau* feast was held in Iwilei—a portion of Honolulu—and Mrs. Nakauina, from her knowledge of the habits of her race, makes no doubt that the crabs and limu caught in the immediate vicinity of the quarantine graveyard formed part of the feast, and she says, very positively: 'Now, those crabs, at the previous high tide, perhaps an hour before, had themselves been feasting on the bodies of those cholera patients, buried on the sandspit, immediately to the seaward of the residence of these fisherwomen. Here was direct, undiluted contagion.' And it should be understood that the crabs, after an interesting method of preparation, are eaten uncooked. The lady elaborately describes the method of the natives in using the crabs, and leaves little doubt on the mind as to the complete deadly career of the microbes. Moreover, she shows that the conduct of the Kanakas, owing to ignorance, is exactly parallel to that of the southern negroes, who could not be compelled to destroy yellow fever infected garments by burning, but would hide them; and the natives of Hawaii wash blankets and bedding in the running streams, unwilling to burn them, and skeptical of the danger. That the dark places of the earth are still 'habitations of cruelty,' is shown afresh by a horribly revolting superstition still holding sway over the minds of many natives. If a person has an enemy, he hires a *kahuna*, or witch, to 'pray the enemy to death'—a process called ana-anaing said enemy—no mention being made of any surreptitious aid the witch may have given to his prayers. If the ana-ana is effectual, the relatives of the dead person have their innings by taking some of the hair and nails, or, preferably, some of the excreta of the dead person, wrapping it in a clean new bit of cocoanut fiber cloth, and placing it under a stone in some water source, in the firm belief that the essence of the dead will spread out in the water, and if drunk by the person who was guilty of ana-anaing the departed, would cause his death in a short time. With our knowledge of the diffusion of bacteria, we shudder at a proceeding matched only by a tie on the railroad or a dynamite bomb. The ignorant islanders did not lay the early deaths to the cholera-infected crabs; but they had all partaken of a pig that had been bought with the proceeds of a horse that had been stolen; the owner of the horse had employed one of the most powerful (unscrupulous?) of the witches to ana-ana the theft of the horse; hence the deaths, in their eyes. It is no wonder that the intelligent lady who fathomed the cause of infection urges the Health Board to guard springs and water courses."

Health Reports.—The following health reports have been received by the Supervising Surgeon-General, Marine-Hospital Service:

SMALLPOX—UNITED STATES.

New Orleans: October 12 to 19, 5 cases, 1 death.

New York City: October 19 to 26, 1 death.

Detroit, Mich.: October 12 to 19, smallpox reported: Rochester, Mich.: October 18, 1 case.

Arizona, Nogales: October 24, 2 cases.

Arkansas, Clay County: September 18 to October 22, 3 cases, 7 deaths.

[1] Journal d'Hygiene, 1895, No. 984.

SMALLPOX—FOREIGN.

Bologna: October 5 to 12, 1 case.
Dublin: October 5 to 12, 24 cases, 1 death.
Gibraltar: September 30 to October 6, 1 case.
Glasgow: September 29 to October 12, 2 cases.
London, Eng.: October 5 to 12, 158 cases, 2 deaths.
Madrid: October 1 to 8, 8 deaths.
Montevideo: September 14 to 21, 5 cases.
Naples: October 5 to 12, 7 cases, 7 deaths.
Paris: October 5 to 12, 1 death.
Prague: September 29 to October 12, 2 cases.
St. Petersburg: September 29 to October 5, 3 cases, 3 deaths.
Tuypan: October 5 to 12, 5 deaths.
Warsaw: September 29 to October 12, 2 deaths.
Singapore: August 1 to 31, 1 death.
Constantinople: July 1 to 31, 41 deaths.

CHOLERA.

Bombay: September 17 to 24, 1 death.
Roubaix: September 1 to 30, 33 deaths.

YELLOW FEVER.

San Juan, Porto Rico: September 21 to 28, 6 cases, 5 deaths: September 28 to October 5, 5 cases, 1 death.

SELECTIONS.

Shortening of the Femur.—Mr. Thomas Bryant has contributed to the *Press and Circular* a recital of his experience in regard to shortening of the lower limb, especially in those cases where the femur is liable to be inculpated. He says that in those cases of shortening of the lower extremity it is essential to closely investigate the condition of the neck of the femur. If this plan be followed, as a regular rule, the explanation of many cases of shortening otherwise obscure and baffling, will be rendered plain. The causes of shortening of the femur may be grouped into five varieties, namely:

1. Impacted fracture of the neck of the femur.
2. Arrest of growth of the neck, following disease the result of injury.
3. Disease of the hip joint.
4. Arrest of growth of the lower end of the femur from disease of the epiphysis.
5. Arrest of growth of the lower end of the femur following disorganization of the knee-joint.

When the shortening of a leg amounts to a quarter of an inch and no more, the defect may be disregarded; this is not unfrequently present naturally or congenitally. Again, half an inch shortening is by no means infrequent after fracture of the thigh. In measuring for any shortening that may be present in a lower limb, it is a good plan first to compare the length of both limbs from the top of the great trochanter of the external malleolus. If the measurement be the same on both sides, then it is obvious that the shortening must be confined to the neck of the shorter femur, excepting always those possible exceptional cases, just above referred to, wherein there is the normal or non-accidental disparity.

Pyemia due to a Capsule Bacillus.—Chiari (*Prager med. Wochenschrift*, 1895, No. 24–27) described a case of pyemia following an ascending suppurative nephritis in which the bacteriologic examination demonstrated the presence of a capsule bacillus as the etiologic agent. The post-mortem examination showed in addition to certain old changes, suppurative nephritis, suppurative prostatitis and cysto-pyelitis, acute endocarditis, and finally an otitis media and a meningitis. In all these foci was found a bacillus which showed a distinct capsule. This bacillus was pathogenic for all ordinary animals used for experimental purposes. Rabbits were most resistant. Subcutaneous injection produced suppuration; intravenous injection caused a rapidly fatal septicemia; injection into the kidneys caused suppurative nephritis with consecutive septicemia. In guinea pigs the intra-abdominal injection caused diffuse peritonitis and death in twelve hours. Mice died very soon after subcutaneous injection at the root of the tail. This bacillus did not lose any of its virulence after repeated cultivations. It was not stained with Gram's method; it grew rapidly in high glycerin-sugar-agar, producing abundant gas. It was distinguished from the Friedlander's pneumonia bacillus by certain cultural peculiarities, by being markedly pathogenic for rabbits and by being fatal to mice after subcutaneous injection. Sections from the diseased organs showed that it had a close relation to the morbid processes and that its presence could not be referred to post-mortem invasion. In all likelihood, the point of entrance was the urethra, hence the cystitis, the prostatitis and the ascending nephritis. From the suppurating foci in the kidneys, the bacilli invaded the blood and caused the endocarditis, the meningitis and the otitis.

Pathologic Relations of the Liver and Intestines.—Professor Hanot of Paris, in concluding his brilliant address on "The Intestines and Liver in Pathology," before the Congress of Internal Medicine recently held in Bordeaux, summed up as follows:[1] Physiologically there exist intimate nervous and circulatory relations between the liver and intestines. The liver is one of the essential parts of general nutrition; it feeds all organic activity and protects it against poisons; and, lastly, it creates the bile. Thus the liver maintains the nutritive equilibrium of the intestine, it continually neutralizes the poisons which arrive at or are formed in the latter viscus; it also aids in the special work of digestion. The physiologic services rendered by the intestine to the liver are not so marked. It brings to the liver a part of the elements of its nutrition and of its special energy; it assists the liver in its digestive function and perhaps assists also in its anti-toxic action. The intestine appears to be a vestibule for all the toxic and infectious agents going to the liver in combinations and in multiple proportions—alimentary poisons like alcohol; digestive poisons like acetic, lactic and butyric acids; microbes and their toxins. Modern science has corrected an error of the old pathology—the portal vein is not the sole carrier of poisons, it brings only external poisons so to speak; the hepatic artery in its turn brings those from the interior of the organism. Again, if the portal vein brings infection from the intestine to the liver, the hepatic artery distributes it generally. The noxious influence of the intestine on the liver is only exercised when the latter organ permits it; it is entirely subordinated to the hepatic condition. It is the state of the relations between the liver and the intestine from a pathologic point of view which is the beginning of the doctrine of intestinal antisepsis. We can now readily conceive that intestinal antisepsis ought not only to comprehend the action exerted directly on the intestine, but also the indirect action exerted on the liver. While we are neutralizing the poisons in the intestine we must maintain or assist the antitoxic power of the liver which helps to annihilate them. In destroying part of the poisons in the intestine we preserve the liver so to speak. Again, by maintaining the antitoxic properties of the liver we defend it against the products of intoxication reaching it from the depths of the tissues and which are added to the poisons of intestinal origin. In short, antiseptic measures are efficacious only when hepato-intestinal antisepsis is maintained.

The Physician in Plato's Republic.—The *Lancet* has the following scholarly note that reveals the mind of the great Greek philosopher concerning the status of medicine in his own time. To those of the profession who are interested in historic reflections, it will be pleasing to note that Plato gave precedence to the physician, empirical though he was in that age, over the contemporary theologian or "hierophant." In Plato's scheme the classes that embrace the artist, the ruler and the merchant were those who stood superior to the physician. The physician stood fourth in a series of eight classes. The *Lancet* says: "In a curious passage in one of the most famous of his dialogues—the Phædrus—Plato sketches his view of the doctrine of the transmigration of souls. The soul which has seen most of truth in its former state comes to the birth as a philosopher, or artist, or musician, or lover; that which has seen truth in the second degree shall be a righteous king, or warrior, or lord; the soul which is of the third class shall be a politician,

[1] Le Bulletin Medical, Aug. 18, 1895.

or economist, or trader; the fourth shall be a lover of gymnastic toils or a physician; the fifth a prophet or hierophant; to the sixth a poet or imitator will be appropriate; to the seventh the life of an artisan or husbandman; to the eighth that of a sophist or demagogue; to the ninth a tyrant. 'All these,' says the philosopher, 'are states of probation, in which he who lives righteously improves, and he who lives unrighteously deteriorates his lot.' The order of precedence in the above list is very curious and highly characteristic of the Hellenic mind. The philosopher at the top of the scale and the tyrant at the bottom show that even Plato was not free from the prejudices of his nation and his caste. The place he assigns to the physician—viz., fourth in the scale—is not a very elevated one, and it is somewhat singular to find him bracketed with the lover of gymnastic toils. It is something, however, to find that the 'prophet or hierophant'—the ancient representative of an important profession—is placed even lower—viz., fifth. Plato's comparatively low esteem for the profession of medicine is not difficult to understand, *since at a time when anatomy consisted of a few crude facts and physiology did not exist* it was impossible that medicine could command the reverence of any profound and penetrating intellect. We find Plato constantly in his dialogues alluding to medicine as if it consisted of little else but giving a purge or an emetic. No doubt Hippocrates was a man of profound genius and of immense knowledge, considering his time, but it is very unlikely that the average practitioner rose above the level of the mere drug-giving empiric. Lovers of Plato, who, we trust, are not few in the profession, may read their favorite author without feeling aggrieved that in his appreciation of medicine he did not rise above the level of his time. It is probable that the average practitioner of those days combined much presumption and not a little chicanery with a plentiful lack of real medical knowledge, and it can hardly be a matter of wonder that the philosopher looked askance upon such pretenders."

Inguinal Hernia of the Gravid Uterus.—Rosanhaff in the *Semaine Medicale*, Oct. 2, 1895, from *Archives für Klinische Chirurgie*, vol. XLIX, Bd. 4, reports a remarkable case of inguinal hernia of the gravid uterus with premature delivery, and finally an operation for the radical cure of the hernia with recovery of the patient. The patient was a woman 45 years of age, who entered the surgical clinic at Moscow for left inguinal hernia, which she had noticed for about five years. In February, 1893, the hernia had become irreducible, and the preceding June was taken with rapid growth coincident with cessation of the menses. The patient had had twelve children and had been delivered of the last three, notwithstanding the existence of the hernia. On her arrival in the clinic in January, 1894, she presented in the left groin a tumor which descended within 6 centimeters of the knee and had the appearance of a very large inguinal hernia. Its form was ovoid, and it measured 45 centimeters from above downward, while its diameter attained 80 centimeters at the largest place. The integuments which covered it were very thin and deeply pigmented. The tumor was dull but movable and presented a compact mass in its interior. It was dull on percussion and a *bruit* could not be heard on auscultation. The patient had never perceived any fetal movement. The neck of the uterus was very much raised and to the touch was in continuity to the hernial tumor. On Jan. 25, 1894, the patient lost a great quantity of amniotic liquid and the tumor considerably diminished. He was able to recognize the position of the fetus, and its head was found in the dependent portion of the sac corresponding to the neck. The neck was turned to the left side. Two hours after the flow of waters there began contractions of the uterus which were minutely observed, and they consisted of peristaltic movements from the fundus of the uterus and were very rapidly propagated from above downward, but the uterus in its entirety contracted energetically, and its transverse diameter was diminished at the same time that its antero-posterior diameter was elongated. The contractions of the uterus were not accompanied by any painful sensation; they terminated alone and without participation of the abdominal muscles, and a fetus of the weight of 2,200 grams was expelled. The next day the womb and a portion of its adnexa were easily reduced into the abdominal cavity. The hernial ring was so large as to easily admit the hand; the left ovary and a part of the tube of the left side resisted taxis. The symptoms following the accouchment were absolutely normal, but unfortunately knuckles of intestine attached themselves to the hernial sac and escaped into the place left free by the uterus. On April 7 it was decided to practice an operation for the radical cure of the hernia. After resection of the ovary and the left tube, which were irreducible, and the reduction of the intestinal folds, he resected the vast sac and closed its neck by sutures. He then made an occlusion of the ring and terminated the operation by suturing the wound after having excised the integuments that were in excess. The patient left the hospital cured in about a month and up to the date of the report had not had any return. This case, says the reporter in the *Semaine Medicale*, is unique of its kind, for on one part the accouchment is operated by the uterine muscles alone, and for another part the uterus was able to be reduced into the abdominal cavity, while all the other cases of uterine hernia heretofore reported have been irreducible. The author believes that the hernia and the left tube, as well as the intestinal folds originally formed the contents of the sac in which the uterus penetrated more slowly.

Electrotherapy as a Means of Diagnosis in Gynecology.—Dr. G. Apostoli, (British Medical Association, 1895) after a long and thorough trial of his method, has come to the following general conclusions:

1. The faradic current of tension (generated by the coil of long and fine wire) applied to the uterine cavity, according to the rules established by Dr. Apostoli in 1883, relieves, for a longer or shorter time, all ovarian pain of nervous or hysterical origin; but remains powerless or nearly so in cases of ovarian pain caused by inflammatory lesion of the peri-uterine tissue or of the appendages.

2. The same faradic current is therefore useful in diagnosis, inasmuch as it helps us to distinguish the nature of so-called ovarian pain, and to determine rapidly the differential diagnosis between hysterical and inflammatory ovarian pain. Where the two kinds of pain exist in the same patient, we are helped to understand their nature by the fact that the one is relieved and the other is not.

3. If, then, the curative effect of the faradic current clears up or rectifies a doubtful diagnosis, it protects us at the same time from undertaking a useless operation. On the other hand, if the same faradic current proves ineffective, the lesion being inflammatory, we are led to resort to a supplementary galvanic treatment or to a surgical operation sooner or later.

4. The constant galvanic current, applied to the uterine cavity in doses gradually increasing from 50 to 120 milliampères, according to the rules published by Dr. Apostoli in 1884, and bearing in mind the individual susceptibility and tolerance, will be almost always supported without much pain during the séance, and without febrile reaction afterward, if the parts adjacent to the uterus are free from inflammation.

Simple cystic, peri-uterine tumors, which are neither inflamed nor suppurating (such as ovarian cysts and hydrosalpinx), may also show perfect tolerance of the galvanic current.

The galvanic current is also sometimes perfectly supported by cases in which the uterus is surrounded by old inflammatory products or exudations no longer pathogenic.

5. There are three classes of cases which should be considered as exceptions to the preceding rule, for they bear the galvanic current more or less badly, though they do not necessarily produce much febrile reaction after the séance.

They are: (*a*), certain forms of hysteria; (*b*), fibro-cystic tumors of the uterus; (*c*), enteritis with false membrane. It is generally easy to diagnose these cases of intolerance.

6. All acute peri-uterine inflammation (of the pelvic cellular tissues, of the peritoneum and especially of the appendages) will cause the galvanic current to be badly borne when it passes 40 or 50 milliampères, and will cause intolerable pain and febrile reaction when carried beyond this intensity.

7. The intolerance for the galvanic current is generally proportionate to the extent and gravity of the lesions referred to, and increases with the intensity of the current employed—especially when it passes 40 or 50 milliampères.

8. All inflammation of the appendages which is curable (symptomatically at least) without radical operation, will bear the galvanic current better and better, and there

will be a corresponding improvement of the prominent symptoms such as pain and hemorrhages. The intolerance noted at the beginning progressively disappears.

9. All grave inflammatory lesions of the appendages, and notably all suppurative processes which are incurable (even symptomatically) by conservative means, show the same intolerance from the beginning to the end of the treatment which was noticed at first, and which is apt to increase instead of diminish if the treatment is continued.

10. Thus, the simple study of the tolerance or intolerance of the intra-uterine galvanic treatment, and especially of the post-operative pain and fever occurring on the evening of, or the day following the treatment, enables us to make the diagnosis. It also, in four or five séances, given twice weekly, informs us of the condition of the appendages, of their possible inflammation and its degree, and in this way it lessens the number of laparotomies and exploratory incisions.

11. The same study of the so-called galvanic reactions also informs us rapidly (in five to ten séances) of the curability of these inflammatory lesions which the electric current has demonstrated, and in consequence of this it tells us in one case to abstain from operation, while in another it shows an operation to be urgent.

12. *En resumé*, gynecological electro-therapeutics, carefully, methodically and patiently applied, instead of being opposed to the marvelous progress of surgery, comes to its aid.

Independently, in fact, of the great therapeutic service which it renders every day, electricity serves as a touchstone; it assists us in diagnosis and thus directly serves the interests of surgery, in one case showing an operation to be useless and dangerous, in another that its necessity is urgent.

Thus, many of laparotomies, so-called exploratory incisions and mutilations practiced without due deliberation for the relief of rebellious ovarian pain, or for lesions of the appendages of uncertain nature, should be, from this time forth, delayed or formally proscribed until all the resources of faradic sedation on the one hand and of the intra-uterine galvanic effect on the other, have been tried. Experience has abundantly proved these currents to be innocuous, if given with necessary aseptic precautions.

NECROLOGY.

Frederick M. Warner, M.D., of New York city, died October 8. He was born in 1857, was graduated from Lehigh University in 1877, and subsequently from the College of Physicians and Surgeons. He was house surgeon in the Nursery and Children's Hospital for a year, then went to Europe and took post-graduate courses at Vienna and Heidelberg. Since 1881 he had practiced in New York. He was a member of the New York Academy of Medicine, and of the boards of several hospitals. A widow and two sons survive him.

Thomas Keith, M.D., LL.D., F.R.S., of London, Eng., October 9, aged 89.——J. H. McLean, M.D., of Cass City, Mich., October 21.——Albert Champau, M.D., of Detroit, Mich., October 19.——G. M. Harris, M.D., of Lorain, Ohio, October 24.——S. E. Clement, M.D., of Paris, Tex., October 18, aged 75.——Judd Packard, M.D., of Racine, Wis., October 22, aged 25.——O. O. Searcey, M.D., of Temple, Tex., October 19.——H. B. Gibson, M.D., of Columbia, Mo., October 18, aged 45.——Abbie J. Seymour, M.D., of Buffalo, N. Y., October 17, aged 42.——T. F. Owen, M.D., of Springfield, Ohio, October 17, aged 64.——T. B. Cox, M.D., of Frankfort, Ind., October 16, aged 78.——R. L. Koepsel, M.D., of Kansas City, Mo., October 16, aged 34. C. W. Stoddard, M.D., Ramsey, Ill., October 11.

MISCELLANY.

An Old Favorite.—[For bronchial spasmodic coughs.]

℞ Tr. benzoin comp 20
Tr. opii camph 20
Tr. cannabis indicæ 5

M. et sig: 10 to 20 drops on loaf sugar, as occasion may require.

A little Australian boy had been to a Museum of Natural History. When he came home he was asked where he had been, and said: "Oh, we've had a lovely time. We've been to a dead circus."—*The Outlook.*

The Language of a Convalescent.—Chief Justice Waite and Judge Hall, of North Carolina, were members of an excursion party on one of the Chesapeake Bay boats. When the steamer had fairly got out into the Atlantic, the sea was very rough, and Judge Hall was taken violently with sea-sickness. As he was moaning aloud in his agony, the Chief Justice, laying a soothing hand on his shoulder, said: "My dear Hall, can I do anything for you? Just suggest what you wish." "I wish," said the sea-sick Judge, "your Honor would overrule this motion."—*Washington Globe.*

Death in Faith-Healer's Family.—A certain religionist of New York city, for whom has been claimed powers of healing only a little short of raising the dead to life, has suffered the loss by death from pulmonary tuberculosis of one of his children. No one will care to gloat over this faith-healer's domestic tragedy, but if some of his blinded adherents could by the sad event have their eyes opened to the limitations of faith-cure, no little causeless suffering might be prevented.

A Thirty-Ounce Emergency Ration.—A dispatch from Washington states that some progress has been made regarding the proposed new emergency ration of the Army. The annual report of the Commissary-General of the United States Army says that under direction of the Secretary of War, a board was appointed by the Commanding General of each department, consisting of one officer of the subsistence department, one officer of the medical department, and three officers of the line of the Army, to report on the components of the emergency rations to be carried on the person of the soldier on emergent occasions, where transportation is limited or is not available, and it is believed that it will be possible to provide a ration weighing not more than thirty ounces that will contain sufficient nutriment for the soldier for one day.

Ludhiana School of Medicine for Women.—It has for some time been in the minds of missionaries and others, to establish a North India School of Medicine for Christian women, at Ludhiana, in the Punjaub. In November, 1894, a beginning was made, and for the last two terms the students have numbered thirteen. Five of these are being trained as nurses, two as compounders, and six have entered for the full course of medical study. With the exception of two English girls, all are natives or Eurasians. The object of the school is to give native and Eurasian girls the opportunity of pursuing a complete course of medical study under the instruction of fully qualified lady doctors, and at the same time to keep them under Christian influence, so that when their curriculum is completed, they may be fitted to minister to the spiritual as well as the physical needs of their suffering sisters, and thus be true medical missionaries. Funds are greatly needed for the completion of the passage money, and also for the support of the school. Scholarships of £20 per year are also much desired, as the students are mostly unable to pay their own fees.

The Samuel D. Gross Prize.—The second quinquennial prize of $1,000 under the will of the late Samuel D. Gross, M.D., will be awarded Jan. 1, 1900, by the Philadelphia Academy of Surgery. The conditions annexed by the testator are that the prize, "shall be awarded every five years to the writer of the best original essay, not exceeding one hundred and fifty printed pages, octavo, in length, illustrative of some subject in surgical pathology or surgical practice, founded upon original investigations, the candidates for the prize to be American citizens." It is expressly stipulated that the successful competitor who receives the prize shall publish his essay in book form, and that he shall deposit one copy of the work in the Samuel D. Gross Library of the Philadelphia Academy of Surgery. The essays, which must be written by a single author in the English language, should

be sent to Dr. J. Ewing Mears, 1429 Walnut Street, Philadelphia, before Jan. 1, 1900. Each essay must be distinguished by a motto, and accompanied by a sealed envelope bearing the same motto, and containing the name and address of the writer. No envelope will be opened except that which accompanies the successful essay. The committee will return the unsuccessful essays if reclaimed by their respective writers, or their agents, within one year. The committee reserves the right to make no award, if the essays submitted are not considered worthy of the prize.

A Popular Sanitary Tax.—Mr. H. A. Andrews has contributed to the October number of *Annals of Hygiene* an account of the Atlanta system of taxation for sanitary purposes. The chief sanitary operations for keeping that city sweet and clean are provided for by a house-tax of $3 per year per house, which is known as the sanitary tax. With the fund thus derived, and also some other sanitary funds, the source of which is not here stated, the city collects all swill, garbage, night soil, sweepings and other filth, and disposes of them in a salutary manner. This house-tax is popular with the average citizen, because he can not otherwise have his premises cared for in the same manner for several times that sum. The city is considering reducing the tax to $2. The garbage from the business portion of the city is collected every day, and generally twice a day, especially in the wholesale and market districts. In the residence portion of the city, where it is thickly settled, collections are made every day; in other portions, three and four times each week. The night soil is taken up from the water closets every week, and none of it is allowed to remain longer. It is emptied from the water-tight vessels directly into sealed barrels and driven immediately to the place of final disposition—the crematory. The combustible waste at all times is allowed to be mixed with the house and store garbage and operates as a great absorbent, and finally as fuel to burn the more offensive filth. This plan is popular with the citizens, as it involves no sorting, nor separation of garbage and trash, or combustible waste. The combustible waste and trash are as valuable to the city as cars of coal or other fuel.

A Vesical Sequela of Ovariotomy.—The *Lancet* for August 24, contains a report of an unusual sequel of an operation for the relief of cystic tumor of the ovary. The reporter is Dr. Walter Falla, of St. Heliers, Jersey, who performed the operation in May, 1894, upon a woman aged 52 years. After operation a good recovery was recorded. About the end of the eighth month the woman began to complain of pain on micturition, and at the twelfth month there was noticed by her a small amount of blood in the urine. In June, 1895, she again consulted her surgeon, and gave all the objective symptoms of urinary calculus, but refused to be examined at that time. The pain, however, increased, and two weeks later the sound was passed, and a stone of large size was readily recognized. About a week later the calculus was removed by lithotrity. The removal of the lithotrite was attended with difficulty and delay, a fact that was subsequently explained when there was found entangled in the blades of the instrument a thick silk ligature covered with a certain amount of phosphatic deposit. The ligature had served as the nucleus for the large vesical calculus, and was without doubt the identical ligature that had been used by the surgeon for tying the pedicle during the ovariotomy. The unusual features are the entry of the ligature through the vesical walls, with practically no disturbance of the general health of the patient for nine months; and that a foreign body of so considerable size as this substantial ligature should dispose of itself in this situation, when it is beyond dispute in the mind of the operator that the bladder was in nowise injured or endangered in the performance of the operation.

Tendon Grafting, a new Operation for Deformities following Infantile Paralysis.—At the meeting of the New York State Medical Association, Oct. 15, 1895 (*Medical Record*, October 26), Dr. Samuel E. Milliken, Surgeon-in-Chief of the New York Infirmary for Crippled Children, and Surgeon to the Infants' and Children's Hospitals, presented a boy 11 years of age upon whom twenty months before he had successfully grafted part of the extensor tendon of the great toe into the tendon of the tibialis anticus muscle, the latter having been paralyzed since the child was eighteen months old. The case which was presented showed the advantages of only taking part of the tendon of a healthy muscle, which was made to carry on the function of its paralyzed associate, without in any way interfering with its own work. The brace which had been worn since 2 years of age was left off, the patient walked without a limp, the talipes valgus was entirely corrected and the boy had become quite an expert on roller skates. Dr. Milliken predicts a great field for tendon grafting in these otherwise hopeless cases of infantile paralysis, who heretofore have been condemned to the wearing of braces all their lives.

How to Read Your Journal.—Not every physician knows how to read a medical journal to the best advantage. With its numerous readers, with diversified tastes to which to cater, and the vast field from which to cull its topics, it would indeed be strange if all parts of the journal were alike interesting to all. The technical discussion of an intricate operation is not of great moment to the busy practitioner, the treatment of pertussis does not interest the oculist, nor the description of the varieties of cataract the gynecologist, and the medical man who attempts to read a journal through, irrespective of its particular value to himself, wastes his time and fails to get good ofttimes from any portion of it. Memory is treacherous in most of us; the thing we want most to remember is often soonest forgotten, and we strive in vain to recall that particular fact which so impressed us as we read the paper. Now this may all be obviated by the employment of a system in reading. Do not try to remember all that you see, but glancing through the pages note the articles that concern you and with a careful reading note in a book kept for this purpose where the information is contained and where the article may be found, should you in the future desire aid upon this point. Such a book, an Index Rerum carefully indexed, is a library in itself and always ready of access, is an invaluable aid in suggestive therapeutics, in difficult and obscure cases, and in all literary work. The work of the *Index Medicus*, whose loss we mourn, can be done for each individual with the expenditure of so little effort and time that it is strange the method is not more universally adopted.—*Atlantic Medical Weekly*.

Illinois State Board of Health.—In making provision for the ordinary and contingent expenses of the State government, the Illinois Legislature appropriated for the State Board of Health: for salary of secretary, $3,000; for necessary office expenses, including expenses incurred in attending meetings of the board, and in making sanitary inspections, $2,000; for chief clerk, $1,800; for clerk, $1,150; for stenographer, $720, and for incidental expenses, $330—all per annum. It also appropriated the sum of $10,000, as a contingent fund, to be used only with the consent and concurrence of the Governor, upon the recommendation and advice of the board, in case of the outbreak or threatened outbreak of any epidemic or malignant disease, such as Asiatic cholera, smallpox, yellow fever, or to defray the expenses of preventing the introduction of such diseases or their spread from place to place within the State, and in suppressing outbreaks which may occur, and in investigating their methods of prevention, also special investigations when required by the necessities of the State; any necessary expenditures from this sum to be paid on the order of the president of the board, attested by the secretary and approved by the Governor.

A Costly Hospital for Contagious Diseases.—One of the new hospitals for the infectious sick of London is known as the Fountain Hospital. It is concerning this institution that the *Sanitary Record* regrets to note that a dispute has arisen between the great Local Government Board and the powerful Metropolitan Asylums Board. "Strictures have been

passed," says the *Record*, "by the former against the latter, generally as to the policy to be adopted in dealing with any outbreak of infectious disease which may occur, such as necessitating increased accommodation for the reception of patients being provided with all possible speed; also, specially, in relation to the expenditure incurred in the erection and equipment of the temporary Fountain Hospital. The Local Government Board complains that, whereas the temporary hospital at Tottenham, which was intended to receive 456 patients, cost £119 per bed, the temporary Fountain Hospital to accommodate 406 persons, has resulted in an expenditure of £288 per bed; that the cost of the latter has involved a charge upon the rates of £128,000; that the expenditure has been excessive; that the items of expense should have been scrutinized with great care and vigilance by the managers, and that the architect should not have been given full power in the erection of the Fountain Hospital. A lengthy letter to this effect was recently forwarded by the Local Government Board to the managers of the Metropolitan Asylums District, and at a meeting of the latter, on October 3, an even more copious reply to those comments, forwarded on the 2d inst., to the Local Government Board, was read and passed. The managers of the Metropolitan Asylums District, in reply to the Local Government Board, dissent entirely from the latter's opinion that they were not justified in leaving the matter, which involved such a large expenditure of public funds, in the hands of one man; and they state that any interference on their part with the discretion of the architect would not only have been imprudent, but that it would have led to confusion and delays, and would probably have added to, rather than diminished the cost. As to the expenditure, the managers point out that, so far as the extra cost is due to the expedition with which the hospital was constructed, they are quite unable to regard themselves as in any sense responsible; the hospital had to be constructed within a certain period, and this necessitated overtime to the extent of finally all night work, and even on Sundays. It is further submitted that, having regard to all the circumstances of the case, and allowing for the additional cost paid for speedy construction, good value has been obtained in the Fountain Hospital, which "is well planned and arranged and well built, and will last for many years." In conclusion, the managers state that they regard the strictures as undeserved and uncalled for, and state that the course pursued was the only one possible under the circumstances.

Therapeutics Without Drugs.—In a recent address delivered by invitation before the Lehigh Valley Medical Association, Dr. Solomon Solis-Cohen, of Philadelphia, directed attention to the fact that drug giving is not essential in our therapeutics in very many cases, and, as a rule, should be made to play a subsidiary part. Acknowledging their usefulness in proper hands and under proper circumstances, the too great frequency with which drugs are resorted to encourages patent medicine taking and amateur prescribing. In very many cases, even of acute disease, recovery will take place under proper care and watchfulness, without any drug taking whatever. Both in acute and in chronic cases, many of the ends for which drugs are given can be better and more safely reached through the use of what may be termed natural or hygienic remedies: namely, heat and cold, air, water, diet, rest, exercise, including under the latter head, massage and electricity. As the evolution of the human being has been achieved through action and reaction, with and in a certain environment, so action and reaction under specially adapted environments may modify physiologic and pathologic processes in such a manner as to assist in recovery from disease. In this connection the effect of climate upon diet, and of altitude upon the respiratory and the circulatory apparatus is worthy of consideration, and also the circumstances and conditions in which diet, climate and altitude may be made use of in therapeutics. It is not necessary to go from home in order to secure many of the benefits of atmospheric change. The inhalation of compressed and rarefied air by means of suitable apparatus may, in Dr. Cohen's opinion, be used to develop the lung and influence the circulatory organs, in the great majority of cases, so as to bring about recovery from pulmonary tuberculosis and afford great relief in emphysema, dilatation of the heart and other pathologic conditions in which the process has gone too far to permit a true cure. Likewise, the use of heat and cold in subduing inflammations (as in pneumonia, certain diseases of the joints, chronic rheumatism, and the like); the use of cold water in typhoid fever, in neurasthenia and other nervous affections, the rest-cure, the treatment of pulmonary, cardiac, and other affections by suitable exercise, and the application of massage and electricity were briefly explained. He believes that blood-letting is a useful therapeutic measure which should be resorted to more frequently than is the present custom, as in many cases it is preferable to the use of drugs. The fundamental thought of the whole lecture was that by studying the means through which nature has brought the human organism to its present condition, endowed it with the power of resistance to climatic vicissitudes and inclemencies of the weather, as well as the ability to resist conditions of disease by automatic cell action, the physician may learn how to employ similar means in aiding the natural processes of resistance and recovery. Although, while doing this, much assistance may temporarily be given by the timely and skillful use of drugs, it is a mistake to make them the sole dependence, and the lecturer called upon teachers and writers to lay greater stress upon those therapeutic measures other than drugs, which had been and always would be used by the best physicians.

Hospital Notes.

THE new St. Vincent Hospital at Green Bay, Wis., was dedicated October 4.——The monthly report of the Protestant Hospital at Columbus, Ohio, shows that there were forty-four patients admitted, and forty-six discharged during the month of September, leaving in the hospital October 1, twenty-five patients. The annual report of the St. Luke's Hospital at Utica, N. Y., shows that there were 387 patients treated in that institution during the past year.——The annual meeting of the Women's and Children's Hospital Association of Syracuse, N. Y., was held October 18. The report showed that 241 patients were treated during the year.——St. Joseph's Hospital, at Memphis, Tenn., was dedicated October 6.——The common council of Janesville, Wis., have voted to appropriate $500 a year to the Oak Lawn Hospital, a private charitable institution of that city, in consideration of the hospital receiving all city charity and emergency patients.

Society Notes.

THE annual meeting of the Mahoning County, Ohio, Medical Society was held at Youngstown, Ohio, October 16.——At the annual meeting of the Wayne County, Mich., Medical Society, the following officers were elected: President, E. B. Smith; Vice-President, W. R. Henderson; Secretary, Frank S. Hough; Treasurer, C. Henri Leonard.——A quarterly meeting of the Fox River Valley Medical Association was held at Oshkosh, Wis., October 22. The annual meeting will be held at Green Bay, Wis., January, 1896.——A regular meeting of the Northern Berkshire Medical Association was held in Springfield, Mass., October 17.

Louisville Notes.

RODMAN.—Dr. W. L. Rodman has returned from a four weeks' stay in Colorado where he went in search of health, much improved.

DEATH REPORT.—Sixty-seven deaths have been reported during the past week. Of these, 35 were males and 32 females; 53 white and 14 colored. Diphtheria and typhoid fever caused 4 deaths each, scarlet fever 1, pneumonia, consumption and organic heart disease caused 6 deaths each, The contagious disease ordinance was not mentioned at the recent meeting of the general council.

PALMER.—The following invitation was issued by the Louisville Surgical Society to the physicians of Louisville, New Albany and Jeffersonville:

"The Louisville Surgical Society requests your presence at the Edward R. Palmer memorial meeting, Saturday evening the twenty-sixth of October, Eighteen Hundred and Ninety-Five, at eight o'clock, Alderman's Chamber City Hall, Louisville, Ky."

The speakers were chosen by the Society from the faculties of the four medical schools as follows: Kentucky School, Dr. J. M. Mathews; Louisville Medical College, Dr. A. M.

Cartledge; Hospital College, Dr. L S. McMurtry; University of Louisville, Dr. J. M. Bodine. The ten minute addresses will be published in the JOURNAL at an early date.

St. Louis Notes.

WEEKLY MORTUARY REPORTS.—The death rate for the week ending October 26, was 19 per 1000. The total number of deaths during the week was 204, as compared with 178 during the preceding week and 168 during the corresponding week of last year. Births reported, 176.

CONTAGIOUS DISEASES.—During the week ending October 26, the following cases were reported: diphtheria, 167 cases, 15 deaths; croup, 23, 13 deaths; scarlatina, 6 cases; typhoid, 12, 4 deaths; measles, 5 cases. Thus far during October, 579 cases of diphtheria have been reported, which indicates the prevalence of the disease when it is compared with the epidemic of 1886, when 690 cases were reported during the month of November. The high death rate among the cases of croup recently reported points to the need of greater accuracy in diagnosis and shows a failure to make use of the facilities afforded by the board of health for that purpose. The board is investigating one case of diphtheria which was treated by a woman who professed ability to cure the disease. A physician was called in only as the child was dying.

AT THE STATE UNIVERSITY measures are being taken to produce diphtheria antitoxin after the German method. The work is in charge of Dr. R. E. Graham, the newly-elected professor of bacteriology. It is proposed to furnish the remedy at cost. The project is under the supervision of the State Board of Health.

THE SATURDAY AND SUNDAY ASSOCIATION is preparing for its annual charitable collection for the benefit of the charitable hospitals of this city. The Saturday collection takes place on November 30, the Sunday collection on December 1. The work is conducted by committees of the Association, the members of which undertake a personal canvass of the various business interests, trades and professions. On Hospital Sunday, collections are taken in all the churches. The work of the Association is entirely non-sectarian, and the distribution of the money realized is apportioned to the hospitals, in accordance with the percentage of charitable work done during the preceding year.

ST. LOUIS MEDICAL SOCIETY.—The program for October 26 included two papers on osteo-myelitis, and one on the use and abuse of uterine curetting.

AT THE COMMENCEMENT of the Rebekah Hospital Training School October 22, Dr. I. N. Love made a very happy address to the graduates and Dr. B. M. Hypes presented the diplomas. The lively interest taken by the public in the education of nurses was well attested by a large audience.

DR. A. C. BERNAYS, it is reported has at last received $5,000 as his fee for his operation upon the wife of the paranoiac, Duestrow. Professor Bernays made an attempt to extract the bullet fired by the insane husband into his wife's brain, and succeeded in prolonging her life for a time. His fee was placed at $15,000, but the compromise to $5,000 was finally effected.

THE MARION-SIMS COLLEGE OF MEDICINE has signalized its prosperity and progress by the purchase of a large addition to its real estate. The new ground gives the college nearly 200 feet on Grand Avenue with 258 feet on Carolina Street. The new ground is acquired with a view to erect a large hospital, an enlarged dental department, and a laboratory.

Washington Notes.

MEDICAL SOCIETY OF THE DISTRICT.—At the meeting of the Medical Society held on the 23d inst., Dr. Mary Parsons presented an abdominal bandage for the retention of displaced kidneys. She mentioned having treated seven cases. Dr. McLaughlin read a paper (and mentioned cases) on cycling as a cause of prostatic disease. Dr. E. L. Morgan read a paper entitled, "Did Jenner Discover Vaccination?" the paper seemed to prove that he did not. Dr. Necker presented a specimen of abscess of the liver (multiple) and read the very interesting history of the case.

PROFESSOR OF CLINICAL SURGERY IN THE COLUMBIAN MEDICAL SCHOOL.—Dr. James Kerr has resigned the chair of professor of surgery in the Georgetown Medical College and accepted the chair of clinical professor of surgery in the Columbian Medical College.

THE GARBAGE CREMATORY SITE.—The Commissioners of the District have approved the Smith System Crematory for garbage, and have decided to locate the plant at the corner of 23d and Winter Streets. The work of construction will be begun at once.

COMMISSIONERS REPORT TO CONGRESS.—The report of the Commissioners to Congress is completed and contains the following estimates: two sanitary and food inspectors, who shall be veterinary surgeons, who shall act as inspectors of live stock, dairy farms, etc., at $1,500 and $900 respectively; an increase of $750 for the support of the chemic laboratory is asked. Six new sanitary and food inspectors at $10,000 are recommended. For the collection and disposal of garbage and dead animals, $57,000. For the purchase of a site and building for isolation hospital for the treatment of minor contagious diseases, $49,000. To prevent the spread of scarlet fever and diphtheria and other minor contagious diseases, including the maintenance of a bacteriologic and disinfecting service, $16,000.

Washington Asylum including Hospital	$ 73,488
Government Hospital for Insane (St. Elizabeth)	104,040
Emergency Hospital and Central Dispensary	15,000
Columbia Hospital including repairs ($5,000)	29,000
Children's Hospital	14,000
Homeopathic Hospital	9,250
Washington Hospital for Foundlings	6,000
Freedmen's Hospital	56,000
Eastern Dispensary (including $10,000 for grounds)	11,000
Washington Home for Incurables	3,000

THE PUBLIC SERVICES.

Army Changes. Official list of changes in the stations and duties of officers serving in the Medical Department, U. S. Army, from October 19, 1895, to October 25, 1895.

Major Charles B. Byrne, Surgeon, leave of absence granted is extended three months.

Capt. William H. Arthur, Asst. Surgeon, is granted leave of absence for one month.

Capt. James E. Pilcher, Asst. Surgeon, extension of leave of absence granted on surgeon's certificate of disability, is still further extended two months, on account of sickness.

Capt. Ogden Rafferty. Asst. Surgeon, is relieved from duty at Benicia Bks., Cal., and ordered to Ft. Bliss, Texas, for duty, relieving Major Clarence Ewen, Surgeon.

Major Clarence Ewen, Surgeon, upon being relieved from duty at Ft. Bliss, Texas, will proceed to San Francisco, Cal., and report to the president of the retiring board for examination.

PROMOTION.

Capt. William H. Corbusier, Asst. Surgeon, to be Surgeon with the rank of Major, Oct. 17, 1895, vice Cronkhite, retired from active service.

RETIREMENT.

Major Henry M. Cronkhite, Surgeon, Oct. 17, 1895.

Navy Changes. Changes in the Medical Corps of the U. S. Navy for the week ending October 26, 1895.

Asst. Surgeon J. C. Rosenbleuth, to instruction at the Naval Laboratory.

LETTERS RECEIVED.

Army and Navy Journal, New York, N. Y.; Arnold, E. E., Warren, R. I.
Brown, P., Toronto, Can.
Criley, B. H., Dallas Center, Iowa; Carstens, J. H., Detroit, Mich.; Clouser, H. D., Hartford City, Ind.; Crothers, Thos. D., Hartford, Conn.; Cochran, Jerome, Montgomery, Ala.
Day, L. T., Westport, Conn.; Daily Advertiser, Boston, Mass.; Dickson, C. R., Toronto, Can.
Friedman, Harry, Baltimore, Md.
Griffen, Catherine, McHenry, Ill.; Girard, A. C., Fort Sheridan, Ill.
Hills, J. D., West Haven, Conn.; Hubbell, A. N. Buffalo, N. Y.
Laughlin, John, Rantoul, Ill.; Lewis, Henry F., Chicago, Ill.; Love, I. N., St. Louis, Mo.
Magruder, G. L., Washington, D. C.; Montgomery, E. E., Philadelphia, Pa.
Poorman, W. M., San Francisco, Cal.; Pettit, J. W., Ottawa, Ill.; Priestly, J. T., Des Moines, Iowa; Pilsbry, A., Philadelphia, Pa.
Roseberry, B. S., Lacon, Ill.
Sykes, J. A., New York, N. Y.; Suiter, A. W., Herkimer, N. Y.; Stoddard, L. F., Ramsey, Ill.
Woods, Hiram, Baltimore, Md.; Woodruff, H. W., Joliet, Ill.; Wire, G. E., Chicago, Ill.